12. MAINTENANCE

12.1 PATROLLING

12.1.1 PURPOSE

This section describes the requirements for patrolling mains and transmission lines.

12.1.2 GENERAL

A patrol may be conducted in conjunction with a leakage survey.

12.1.3 PATROLLING OBSERVATIONS

12.1.3.1 During each patrol, observations shall be made for aboveground conditions at or adjacent to a pipeline for the following:

a. Physical indications of leaks, such as blowing gas or dead vegetation.

b. Excavations.

c. Aboveground construction.

d. Demolition.

e. Land subsidence.

f. Flooding.

g. Unusual river or tidal occurrences.

h. Washouts

i. Loss of embankments.

j. Damage caused by hurricanes or other storms.

k. Unexplained exposure of a buried pipeline.

l. Excessive secondary load on a pipeline.

m. Physical deterioration of exposed piping or piping supports.

n. Other conditions that could cause damage to the pipeline.

12.1.3.2 Pipeline location drawings/plans shall be reviewed during the patrol of pipelines with an MAOP greater than 200 psig to determine whether they require revision (e.g., street reconstruction). This review shall be made at least once each calendar year, but at intervals not exceeding 15 months, and should be performed in conjunction with one of the patrols required in **§12.1.5.3.**

12.1.4 PATROLLING MAINS

12.1.4.1 Designated Operations personnel shall conduct patrols in conjunction with their routine duties, including when:

a. Performing inspections in accordance with the requirements of 220 CMR 113 for cast-iron mains.

b. Performing mobile leak surveys.

12.1.4.2 Mains that have an MAOP greater than 200 psig shall be patrolled at the intervals specified in **§12.1.5.3.**

12.1.4.3 Corrosion personnel shall conduct patrols of known aboveground mains for atmospheric corrosion in accordance with **§8.12.**

12.1.5 PATROLLING TRANSMISSION LINES

12.1.5.1 Utility Engineering shall identify the location of transmission lines and mains that have an MAOP greater than 200 psig, and provide such information to the appropriate patrolling personnel.

12.1.5.2 The patrolling of transmission lines shall be performed by designated Operations personnel.

12.1.5.3 Each transmission line shall be patrolled four (4) times each calendar year. The interval between each patrol shall not be greater than four and one half (4-1/2) months.

12.1.5.4 Corrosion personnel shall patrol each exposed segment of transmission line for atmospheric corrosion in accordance with **§8.12.**

12.1.6 REPORTING AND ACTING UPON CONDITIONS OBSERVED

12.1.6.1 Each condition under **§12.1.3.1** that is observed during a patrol shall be reported, as soon as possible after discovery, to the designated Operations personnel having jurisdiction for maintenance of the pipeline.

12.1.6.2 The designated personnel receiving the report in accordance with **§12.1.6.1** shall determine:

a. Whether remedial action is necessary.

b. The remedial action to be taken, if any.

c. Whether to patrol the reported location more frequently until the observed condition is eliminated or remedial action is taken.

d. Whether physical movement of or external loading on a main is anticipated, and that such movement or loading could cause leakage. If so, the main shall be patrolled at least:

1. Four times each year at intervals not exceeding 4 ½ months when the main is located in a business district; or

2. Twice each year at intervals not exceeding 7 ½ months when the main is located outside a business district.

12.1.6.3 Any observation made during the annual review in **§12.1.3.2**, which requires that the pipeline location plans/drawings be revised, shall be forwarded to the Operations Engineer, or designee.

12.1.6.4 Whenever the route of a pipeline with an MAOP above 200 psig has changed, the Operations Engineer, or designee, shall ensure that updated plans/drawings showing the route of the pipeline (e.g., 400 scale maps) are forwarded to the fire and public works departments in the municipalities through which the pipeline passes.

12.1.7 PATROLLING RECORDS FOR MAINS

The following shall be documented and filed with Utility Engineering:

12.1.7.1 Each condition reported and action taken in accordance with **§12.1.6.2**.

12.1.7.2 Any annual pipeline location reviews conducted for mains in accordance with §**12.1.3.2**.

12.1.8 PATROLLING RECORDS FOR TRANSMISSION LINES

12.1.8.1 Each transmission line shall have a file that demonstrates compliance with 49 CFR 192.705 Transmission lines: Patrolling. Each file shall be administered by Utility Engineering.

12.1.8.2 Each file shall include, but not be limited to, the following:

a. A brief description of the transmission line.

b. A plan or sketch showing its location.

c. A record of each patrol conducted.

d. A record of each patrol conducted stating that:

1. A leak was not discovered on the date of patrol; or

2. The location of each leak discovered on the date of patrol.

e. Each condition reported and action taken in accordance with **§12.1.6.**

f. Documentation of the annual pipeline location review conducted in accordance with **§12.1.3.2**.

[REF.: 49 CFR 192.705, 192.709, 192.721; 220 CMR 109.07(2), 109.13(4)]

12.2 LINE MARKERS FOR MAINS AND TRANSMISSION LINES

12.2.1 PURPOSE

This section describes where line markers for mains and transmission lines shall be placed and in which Class locations (as defined under 49 CFR § 192.5) such line markers are required.

12.2.2 MARKING BURIED MAINS - CLASS LOCATIONS

12.2.2.1 Line markers shall be installed and maintained at the locations specified in **§12.2.4** for buried mains within Class 1 and Class 2 locations.

12.2.2.2 For mains with an MAOP greater than 200 psig that are not located within the confines of a take station, line markers shall be installed and maintained in accordance with transmission line requirements (see **§12.2.3**).

12.2.2.3 Line markers may be voluntarily installed over buried mains within Class 3 and Class 4 locations, as deemed appropriate by Utility Engineering. A voluntarily installed line marker should be maintained until it is no longer needed, at which time it should be removed.

12.2.3 MARKING BURIED TRANSMISSION LINES - CLASS LOCATIONS

Line markers shall be installed and maintained for buried transmission lines at the locations specified in **§12.2.4** for buried transmission lines:

12.2.3.1 Within Class 1 and Class 2 locations.

12.2.3.2 Within Class 3 and Class 4 locations except where a marker would:

a. Be extremely difficult to install or maintain;

b. Be extremely expensive to install or maintain;

c. Create a dangerous condition;

d. Be ineffective because it would be obscured;

e. Be ineffective because it would not serve to reduce the likelihood of excavation-type damage.

12.2.4 LOCATIONS TO PLACE LINE MARKERS FOR BURIED PIPE

A line marker shall be placed and maintained as near as practical over each buried main and transmission line specified in §§**12.2.2.1**, **12.2.2.2**, and **12.2.3** at each:

12.2.4.1 Crossing of a public road.

12.2.4.2 Crossing of a railroad.

12.2.4.3 Unconventional location where marking would reduce the possibility of excavation-type damage or interference.

12.2.5 MARKING ABOVEGROUND PIPELINES

Line markers shall be placed and maintained along each aboveground main or transmission line, which is in an area that the public can readily gain access to; that is, capable of being reached in an unrestricted location, or without undue effort.

12.2.6 LINE MARKER WARNING

12.2.6.1 As a minimum requirement, each line marker shall have printed on it:

a. The word "Caution" followed by the words "Gas Pipeline" or "Natural Gas Pipeline."

b. The statement, "Before digging call Dig Safe 1-888-344-7233."

c. The statement, "In case of emergency call Westfield Gas & Electric 1-413-572-0000."

12.2.6.2 The letters in the words described in §**12.2.6.1**a. shall be at least 1" high with 1/4" stroke. Those letters may be smaller on line markers installed in heavily developed urban areas. All other words and numbers printed on the marker may be any size.

12.2.7 LINE MARKER MOUNTINGS

12.2.7.1 When line markers are to be installed, standing line markers shall be used for buried mains and transmission lines in all Class locations, except line markers may be flush mounted on streets, sidewalks, and other appropriate surfaces to minimize situations where placement of standing markers would be objectionable in Class 3 or Class 4 locations.

12.2.7.2 Line markers for aboveground mains and transmission lines accessible to the public (see **§12.2.5**) shall be standing mounted, flush mounted, or mounted directly upon the pipe, depending upon the location of the pipeline.

12.2.8 RECORD KEEPING

A record of the location where each line marker is installed or removed shall be made. The record shall be forwarded to, and retained by, Utility Engineering.

[REF.: 49 CFR 192.707; 220 CMR 109.07(l)]

12.3 DISTRIBUTION SYSTEM LEAKAGE SURVEY PROGRAM

12.3.1 PURPOSE

This section prescribes requirements for the Department's Leakage Survey Program.

12.3.2 GENERAL

12.3.2.1 Utility Engineering shall be responsible for the implementation of the Leakage Survey Program.

12.3.2.2 The Leakage Survey Program shall be performed by personnel qualified by training or experience in the particular component of the Leakage Survey Program being performed.

12.3.2.3 The Leakage Survey Program shall be surveillance, annual weather conditions, results of previous surveys, and changes in distribution systems and gas pressures in the system.

12.3.2.4 All leaks shall be classified in accordance with **§13.9 Emergency Procedures.**

12.3.3 LEAKAGE SURVEY PROGRAM

Each year the Leakage Survey Program shall be reviewed and revised for the upcoming year. The individual leakage surveys or patrols in the program follow:

12.3.3.1 Mobile FI Surveys: All distribution system transmission lines, mains, and service lines within roadways shall be surveyed annually with a mobile FI detector. Surveys conducted during the growing season may be complemented by observations of the vegetation. (See 220 CMR 101.06(21)(a)(b)(c), 220 CMR 107.07(l) and 49 CFR 192.723(b)(1)(2).)

12.3.3.2 Service Pipe Walking Surveys: At least once every 3 years, all services outside of business districts shall be leakage surveyed by walking each buried service line with a portable FI unit. (See 220 CMR 107.07(l), 49 CFR 192.723(b)(2).)

12.3.3.3 Building Surveys: A leakage survey of designated schools, hospitals, churches, theaters and arenas shall be conducted by consultants and/or Field Operations personnel annually. (See 220 CMR 101.6(21)(d).)

12.3.3.4 Winter Patrols: Survey patrols shall be conducted during winter months, principally over the cast-iron system, with a frequency determined by degree-day data, current leak incidents, and the value code. (See 49 CFR 192.723(b) and 220 CMR 101.6(21)(a)(b)(c).)

12.3.3.5 Cast-Iron Encroachment Surveys: A leakage survey of cast-iron pipe that has been encroached upon by third-party construction, and is awaiting remedial action. (See 220 CMR 113.06(3), 113.07(5).)

12.3.3.6 Blasting Surveys: A leakage survey of existing pipelines in the event of third-party blasting near existing pipelines. (See 49 CFR 192.614(b)(6)(ii).)

12.3.3.7 Pre-Paving Surveys: A leakage survey of streets conducted prior to re-paving. (As requested by cities and towns).

12.3.3.8 Additional Surveys: As necessary, additional leakage surveys shall be conducted for post-construction, field supervisor requests, monitoring, pinpointing and other related situations.

12.3.3.9 Pipelines that have an MAOP greater than 200 psig shall be leakage surveyed at least once each calendar year, but at intervals not exceeding 15 months.

12.3.4 REPORTS OF LEAKS OTHER THAN BY SURVEY PROGRAM

Any notification or report of a leak from a source other than by the Leakage Survey Program shall be promptly investigated in accordance with the appropriate Operations procedures.

12.3.5 RECORDS

12.3.5.1 Records, which may include survey data, consultants reports, maps and required survey reporting forms of Mobile FI Surveys, Service Pipe Walking Surveys, Building Surveys, Winter Patrols, and Blasting Surveys shall be retained for a period of time not less than the interim between successive surveys. Records for the above, shall be retained by Utility Engineering.

12.3.5.2 Records of Cast-iron Encroachment Surveys shall be retained by Utility Engineering for at least five years.

12.3.5.3 Records of all other leakage surveys shall be retained by Utility Engineering for at least one year.

[REF.: 49 CFR 192.706, 192.723; 220 CMR 101.06(21), 107.07(l), 109.13(5)]

12.4 LEAKAGE SURVEY AND INSPECTION, OF GAS FACILITIES AT SPECFIC BUILDINGS OF ASSEMBLY

12.4.1 PURPOSE

The purpose of this section is to prescribe the leakage survey and inspection requirements for schools, hospitals, theaters, arenas, and places of public worship.

12.4.2 SCOPE

The gas facilities of buildings of assembly, which are specifically defined under **§12.4.3**, shall be leakage surveyed and inspected in accordance with this section.

12.4.3 DEFINITIONS

12.4.3.1 *School:* A building in which persons are taught, trained, instructed, or educated by a recognized institution. This includes primary and secondary public, private, and parochial schools, technical and vocational schools, and colleges and universities.

12.4.3.2 *Hospital:* A building where the sick or injured can be treated and, if necessary, remain as a patient overnight or for an extended period of time.

12.4.3.3 *Theater:* A building for showing motion pictures, for commercial, public, and academic performances of the arts (e.g., drama, music, song, or dance), or for the assembly of a large audience for entertainment.

12.4.3.4 *Arena:* A building, or a partially or totally enclosed structure, for public, commercial, or academic performance of sports, entertainment, or notable events before a large audience, such as, games, races, concerts, expositions, and conventions.

12.4.3.5 *Place of Public Worship:* A building for public worship, such as a church, chapel, synagogue, or temple.

12.4.3.6 *Service Entrance:* The point at which a service line enters into a building or a partially or totally enclosed structure.

12.4.4 LEAKAGE SURVEY AND INSPECTION

12.4.4.1 At least once each calendar year, the Department-owned, exposed, inside and outside gas piping, including any meters and regulators, for each school, hospital, theater, arena, and place of public worship shall be:

a. Leakage surveyed with a CGI.

b. Visually inspected for its physical condition, including any readily accessible service entrance for an inside meter set.

12.4.4.2 In the event of a "Can't Get In" situation, the Department representative should initially leave a "Notice" card. If a prompt response is not received, the appropriate Utility Foreman should send a form letter requesting access to the building. If a timely response is still not received, the Utility Foreman should take any other actions necessary to gain access to the building and perform the inspection (e.g., sending additional letters, attempting to contact the building's owners or managers by phone).

12.4.4.3 Any inside leak that is discovered during the survey shall be repaired or reported immediately:

a. If a Department employee is conducting the survey, they shall attempt to repair the leak and/or make it safe. If a temporary repair is made, the employee shall complete a service repair report.

b. If the Department employee cannot repair the leak, even temporarily, they shall immediately report the leak to Dispatch as a Grade 1 leak.

c. If a contractor is conducting the survey, they shall report the leak immediately to the Customer Services call center.

12.4.4.4 Any outside leak that is discovered during the survey shall be classified. Grade 1 leaks shall be reported immediately to the Customer Services call center. Grade 2 and 3 leaks shall be submitted to the appropriate Divisional Field Coordinator.

12.4.5 RECORD KEEPING

12.4.5.1 A record of the last two annual leakage surveys conducted in accordance with **§12.4.4.1** shall be maintained.

12.4.5.2 The form entitled, "Leak Survey Building Inspection," for each building of assembly shall be completed after each survey (see page A-24). The form shall be maintained by Utility Engineering.

12.4.5.3 The list of buildings to be surveyed should be updated at least annually.

[Ref.: 220 CMR 101.06(21)(d)]

12.5 LEAK INVESTIGATION

12.5.1 PURPOSE

The purpose of this section is to provide for continuous, coordinated investigation of unclassified gas leaks by the Department, and the immediate response to all reported Grade 1 leaks.

12.5.2 GENERAL

Operations Management should meet at least once each year to discuss changes to leak investigation procedures.

12.5.3 EMERGENCY RESPONSE

12.5.3.1 Any report of a gas odor or leak shall be considered as an emergency, receive prompt evaluation, and if needed, continuous mitigating action in accordance with **§13.9.**

12.5.3.2 Any Department supervisor who responds to a gas odor or leak report, and whose vehicle is equipped with an FI unit, shall proceed to the location with the FI unit in operation.

a. When a Department supervisor arrives at the location prior to other leak investigation personnel, the area of the reported leak shall be FI surveyed at speeds determined by weather conditions, but not in excess of 10 mph. All FI readings should be verified with a CGI.

b. When a Department supervisor arrives at the location subsequent to other leak investigation personnel, the Department supervisor shall review the results of the leak investigation and take appropriate action.

12.5.3.3 All leaks shall be graded and handled in accordance with **§13.9**.

12.5.3.4 When both maintenance and service personnel are on the scene of a reported leak, they shall regularly inform each other as to the progress of the ongoing leak investigation.

12.5.3.5 The Senior Authority at a Leak Investigation shall be as designated by **§13.7.**

12.5.4 GAS CONTROL

The Utility Supervisor, or designee, shall notify Dispatch of odorant spills and leaks, over-odorization, or gas leaks at production facilities and transmission lines. Dispatch shall then notify the appropriate Operations personnel.

12.5.5 TRAINING

All personnel who respond to leaks or perform leak investigation shall be initially trained in their duties and retrained as necessary.

12.6 EXCAVATIONS

12.6.1 PURPOSE

This section describes the requirements of Department employees or its agents before entering and while occupying a trench, pit, or other excavation.

12.6.2 DEFINITIONS

12.6.2.1 *Trench:* A narrow excavation (in relation to its length) made below the surface of the ground. In general, the depth of a trench is greater than its width, and the width (measured at the bottom) is not greater than 15 ft (4.6 m). If a form or other structure installed or constructed in an excavation reduces the distance between the form and the side of the excavation to 15 ft (4.6 m) or less (measured at the bottom of the excavation), the excavation is also considered to be a trench.

12.6.2.2 *Excavation:* Any man-made cut, cavity, trench, or depression in an earth surface that is formed by earth removal.

12.6.3 GENERAL

12.6.3.1 Any test performed to determine the presence of combustible gas, oxygen, and carbon monoxide shall be performed with properly calibrated detection equipment.

12.6.3.2 Before an excavation that can be reasonably expected to contain combustible gas is entered, a fire extinguisher shall be placed on the ground in close proximity to the excavation.

12.6.3.3 Any excavation deeper than or equal to 4 feet (1.22 meters), or where an oxygen deficiency or hazardous atmosphere is present or could reasonably be expected must be tested prior to entry.

12.6.3.4 While a excavation is occupied, its atmosphere shall be periodically monitored for combustible gas, oxygen level, and the presence of carbon monoxide, if it can be reasonably expected that a hazardous atmosphere may be present. Instrument alarms shall be set at 10% LEL, 19.5% oxygen, and 35 to 200 ppm carbon monoxide. The excavation shall be vacated immediately upon an alarm signal.

12.6.3.5 Forced ventilation in a excavation shall not be required as long as the monitored atmospheric conditions in **§12.6.3.4** have not caused an alarm signal.

12.6.3.6 An excavation's opening shall be guarded, barricaded, or protected in a manner to decrease the possibility of a person accidentally falling into the excavation.

12.6.3.7 All materials, spoils, and equipment that might fall or roll into the excavation must be kept at least 2 feet (.61 meters) from the edge of the excavation.

12.6.4 SAFETY EQUIPMENT FOR EXCAVATION ENTRY

An employee shall have the following equipment available to support safe entry and occupancy in excavations. Employees shall be trained in the use of the appropriate equipment that is needed to perform their work.

12.6.4.1 Instrument(s) for testing and monitoring the atmosphere in excavations.

12.6.4.3 Fire-retardant suit(s) or clothing.

12.6.4.4 Safety harness with a flame-retardant lifeline. (The safety harness may be an integral part of the fire-retardant suit.)

12.6.4.5 Hoist capable of lifting a person from a excavation.

12.6.4.6 Fully-charged SCBA.

12.6.4.7 Fire extinguisher.

12.6.4.8 Guard, fence, barricade, or other protective or warning device(s).

12.6.4.9 Hard hat(s).

12.6.4.10 Ladder or other safe means of excavation egress.

12.6.5 TESTS PERFORMED BEFORE ENTRY INTO ANY EXCAVATION

12.6.5.1 If it is reasonable to expect combustible gas in an excavation, as is with leak repairs, a test for the presence of combustible gas shall be performed just below the excavation's grade by testing with a CGI. probe.

12.6.5.2 If the reading obtained in **§12.6.5.1** was 10% LEL or greater, the excavation shall be allowed to naturally ventilate for at least five minutes before proceeding with further tests.

12.6.5.3 From above ground, the CGI's probe shall be used to test the excavation's atmosphere at about four feet below the grade, and, if practical, at other locations where gas may accumulate in the excavation.

12.6.5.4 From above ground, a multiple-gas monitoring instrument shall be used to test the excavation's atmosphere at about three feet above the excavation's bottom for combustible gas, oxygen, and carbon monoxide.

12.6.5.5 If the combustible gas reading is 10% LEL or more, the oxygen reading is less than 19.5%, and/or the carbon monoxide reading is 200 ppm or more, forced ventilation shall be used to attain readings of less than 10% LEL for combustible gas, of 19.5% oxygen or more, and less than 200 ppm of carbon monoxide. When such readings cannot be attained, the entry into the excavation shall be considered an Emergency Excavation Entry, and the procedures under **§12.6.8** shall be followed.

12.6.5.6 All pre-entry test readings shall be recorded before any person enters a excavation. Subsequent tests may also be recorded.

12.6.6 EXCAVATION ENTRY

12.6.6.1 A excavation may be entered without a SCBA or forced ventilation, provided all of the following conditions exist:

a. The CGI reading is less than 10% LEL.

b. The oxygen level reading is at least 19.5%.

c. The carbon monoxide reading is less than 200 PPM-

12.6.6.2 While the excavation is occupied, its atmosphere shall be monitored as needed if it it expected to in accordance with **§12.6.3.4** and vacated immediately upon an alarm signal.

12.6.6.3 A excavation may be entered when forced ventilation is required to meet the conditions set forth in **§12.6.6.1**, provided that the forced ventilation remains in operation while the excavation is occupied. The requirements of **§12.6.6.2** shall be followed.

12.6.6.4 When forced ventilation is required, at least one person shall remain above ground and shall maintain visual or audible contact with the person(s) in the excavation until the excavation is vacated.

12.6.7 LEAK INVESTIGATION EXCAVATION ENTRY

12.6.7.1 Only personnel designated by each Utility Supervisor, Operations Engineer, or Operations Supervisor, or designee, shall enter a excavation for leak investigation.

12.6.7.2 No Department personnel shall enter a excavation owned or operated by another Company, unless access is provided and approved by an employee of that Company authorized to grant such access. When performing a leak investigation, the Department employee shall follow this section and the procedure of the other Company, where more stringent.

12.6.7.3 The duration of occupancy in a excavation shall not exceed the amount of time to perform the leak investigation and

eliminate or mitigate the cause of the leak, if one is found.

12.6.7.4 A excavation may be entered and occupied without a SCBA, provided the atmospheric conditions under **§12.6.6.1** exist within the excavation and the procedures under **§§12.6.6.2**, **12.6.6.3**, and **12.6.6.4** are followed.

12.6.8 EMERGENCY EXCAVATION ENTRY

12.6.8.1 Entry of a Department excavation shall be considered an Emergency Excavation Entry when one or more of the following conditions exist:

a. The CGI reading is 10% LEL or more.

b. The oxygen reading is less than 19.5%.

c. The carbon monoxide reading is 200 ppm or more.

12.6.8.2 An Emergency Excavation Entry should be performed only when approval for entry has been granted by a Utility Supervisor, or designee.

12.6.8.3 Only personnel designated by the Operations Engineer, Operations Supervisor, or designee, shall perform an Emergency Excavation Entry.

12.6.8.4 At least one person shall remain above ground and shall maintain visual or audible contact with the person(s) in the excavation until the excavation is vacated.

12.6.8.5 An employee performing an Emergency Excavation Entry shall:

a. Wear a fire-retardant suit or clothing

b. Wear a safety harness with a flame-retardant lifeline attached thereto.

c. Use a fully-charged SCBA.

12.6.8.6 The lifeline referred to in **§12.6.8.5b.** shall extend above ground. At least one person shall be continuously present above ground while the employee is in the excavation; and the person(s) shall be capable of lifting the employee from the excavation with a hoist.

12.6.8.7 The duration of occupancy in the excavation shall not exceed the capacity of the SCBA to support life.

12.6.8.8 A SCBA that has been used shall be fully recharged as soon as practicable.

12.7 SOIL AERATING

12.7.1 PURPOSE

This section describes the method used to evacuate gas from the soil's atmosphere when pinpointing a gas leak or when pulling residual gas away from foundations and other confined spaces.

12.7.2 USE OF SOIL PURGERS

12.7.2.1 Use of soil purgers or aerators should be avoided when pinpointing a leak, as they disrupt the natural venting of a gas leak. The soil purger or aerator should only be used to pinpoint leaks when a definite "hot" spot cannot be located due to large spread and consistency of gas readings.

12.7.2.2 Upon completion of a leak repair, soil purging or aerating may be necessary to eliminate residual gas adjacent to foundations and other confined spaces. The soil purging should take place near the active leak area over the main or service (at highest reading). This positioning of the soil purger will draw residual gas away from affected structures. While purging, bar hole readings should be taken to ensure that the levels of residual gas are dropping.

12.7.2.3 Soil purgers should not be placed at a building wall, because the purger may draw gas toward it.

12.7.2.4 Where clay-type soils or methane/propane mixtures are present, multiple purge points may be necessary to clear the gas.

12.8 ABANDONMENT OF MAINS

12.8.1 PURPOSE

The section prescribes the procedure for properly abandoning mains.

12.8.2 GENERAL

All mains that are to be abandoned in place shall be physically severed from all sources of gas, and abandoned in accordance with **§11.9**, The ends of an abandoned main shall be sealed by an approved method.

12.8.3 PROCEDURE

12.8.3.1 Service Lines From Mains To Be Abandoned

a. Where entry is possible, premises that could be served by a main to be abandoned shall be inspected for service piping. Those service lines

found active and metered shall be connected to a live main. Inactive service lines and active service lines, which are not officially metered, shall be properly abandoned with the main.

b. All service lines abandoned with the main shall be documented in accordance with Department procedures.

12.8.3.2 Main Abandonment

a. An approved stoppering method shall be used to stop the flow of gas into the main to be abandoned. Once the stoppers are in place, a section of pipe shall be cut out between the source gas pipe and the main to be abandoned. The length of pipe removed shall be sufficient enough to accommodate an approved method of sealing the open ends.

b. An approved end cap shall be used to seal the source gas pipe end. The end cap shall be affixed to the source gas pipe in accordance with approved Department procedures.

12.8.3.3 Purging Abandoned Pipelines

All abandoned pipelines shall be purged in accordance with **§11.9**.

12.9 CLEARING OF SERVICE LINE BLOCKAGES

12.9.1 PURPOSE

This section describes the procedure for clearing low-pressure service line blockages.

12.9.2 GENERAL

Department personnel checking service lines for blockages shall take gas pressure readings, with all appliances at their maximum rated input to verify the location or cause of the pressure problem. Pressure readings shall be noted on the appropriate work order.

12.9.3 PROCEDURE FOR CLEARING SERVICE LINE BLOCKAGES

The following procedure shall be used to clear blockages in service lines.

12.9.3.1 Prior to opening the service line, a verification shall be made that it is low pressure by checking for a regulator. A wooden plug, duct seal, wet rag, and any other necessary material should be available to block gas from flowing into the area where the service line enters the premises.

12.9.3.2 Prior to opening the service line, potential sources of ignition shall be removed at the service line entrance and at the location of gas discharge, unless precautions are taken to perform the operation in a safe manner by ventilating the space, controlling the flow of gas, blocking off the area of discharge, and by eliminating all hazardous conditions.

12.9.3.3 The plug at the service tee shall be removed and the required fitting(s) and special tee for wiring (i.e., tee with slotted opening) installed. The special tee shall include a cap to allow for inserting wire through the cap and valved outlet to provide for hose connection to vent gas outside the premises. A sufficient length of hose shall be attached to the special tee to extend the hose outside the premises. The hose shall have a means for collecting debris attached to the end outside the premises.

12.9.3.4 Gloves, dust mask, and goggles shall be worn by personnel wiring the service line.

12.9.3.5 The service line shall be wired using the special tee. The valve on the tee shall be closed.

12.9.3.6 Once the wiring is completed, the valve used to vent the gas outside the premises shall be opened.

12.9.3.7 The service line shall be rechecked for flow/no flow pressure drop. If excessive pressure drop still exists, the service line shall be wired again. Dispatch shall be notified of service lines in which the blockage cannot be cleared.

12.9.3.8 On completion of clearing the service line, the special tee and fitting(s) shall be removed and the service tee plugged.

12.9.3.9 The foundation at the service line entrance shall be checked with a CGI for any indication of a gas leak. A positive gas read on the CGI shall require the implementation of a Leak Investigation in accordance with §6 of the Emergency Plan.

12.9.3.10 The special tee, fitting(s), and hose shall be removed from the premises ensuring that no particulate removed from the service line as a result of wiring is released within the premises.

12.9.3.11 Particulate removed from the service line shall be placed in a plastic bag for disposal. Soiled gloves shall also be placed in the plastic bag for disposal. The bag shall be sealed with a twist tie.

12.9.3.12 At the end of the work day, bags in **§12.9.3.11** shall be removed from the vehicle and disposed of at the appropriate reporting station.

12.10 INACTIVATION OF SERVICE LINES

12.10.1 PURPOSE

This section provides a uniform method for inactivation of service lines.

12.10.2 METHOD OF INACTIVATION

Whenever the Department receives notice that service to a customer is to be discontinued, or discovers that an account has become inactive, the inactivation shall be accomplished by one of the following methods:

12.10.2.1 When the service line supplies more than one meter, the meter cock at the appropriate meter shall be closed and locked with a Department approved device.

12.10.2.2 When a service line supplies a single meter, the meter cock and the service cock shall be closed and at least one of them locked with a Department approved device.

12.10.2.3 A mechanical device (e.g., typically a metal disc commonly referred to as a "cookie") shall be installed in the service line or meter assembly to prevent the flow of gas to the customer. This may also be done in addition to **§12.10.2.1** or **12.10.2.2**.

12.10.2.4 The meter(s) shall be removed so that the customer's piping is physically disconnected from the gas supply. The open ends of the pipe shall be sealed (e.g. plug, cap or other Department approved device).

12.10.3 METER REMOVAL

Except when meters are removed in accordance with **§12.10.2.4**, after a service line has been inactive for six months, the meter(s) shall be scheduled for removal within the following six months.

12.10.4 INACTIVE SERVICE LINE MAINTENANCE

Each inactive service line shall be maintained as an active service line, until it is abandoned in accordance with 220 CMR 107.05.

12.10.5 INACTIVE SERVICE FILE

12.10.5.1 Utility Engineering shall maintain an Inactive Service File ("File").

12.10.5.2 When a service line becomes inactive in accordance with **§12.10.2**, it shall be entered in the File.

12.10.5.3 The following information shall be included in the File:

a. The location of the service line.

b. The date the service line was installed; if known.

c. The date the service line became inactive.

d. The type of service line; (e.g. plastic, cathodically protected steel, unprotected steel, copper.)

e. The date the service line was abandoned, if applicable.

If any of the above information is unavailable or unobtainable, it shall be listed as "unknown" or as a blank in the electronic database.

(REF.: 49 CFR 192.727; 220 CMR 107; DPU 89-PL0101

12.11 ABANDONMENT OF INACTIVE SERVICE LINES

12.11.1 PURPOSE

This section prescribes the uniform method for abandonment of inactive service lines.

12.11.2 DEFINITIONS

12.11.2.1 *Abandoned Service Line:* A service line that is disconnected or cut off as close as practical to the main or other source of supply, purged, if necessary, and sealed.

12.11.2.2 *Inactive Service Line:* A service line where gas service to a customer has been discontinued but the service line has not been abandoned.

12.11.3 GENERAL

12.11.3.1 Abandonment of inactive service lines shall be made in accordance with

Massachusetts Regulation 220 CMR 107.00.

12.11.3.2 The procedure for abandonment of an inactive service line that operates at a pressure greater than 100 psig shall be established by the Operations Engineer, or designee, before abandonment.

12.11.3.3 Utility Engineering:

a. Provide a list of inactive service lines on a regular basis to Field Operations to enable them to schedule abandonment of inactive service lines in accordance with **§§12.11.4.2** and **12.11.4.3.**

b. Develop and maintain a record-keeping and reporting system for service lines that are abandoned.

c. Prepare and submit an annual report to the DTE and Operations Superintendent for the preceding year, no later than March 15th. The report shall indicate the total number of inactive services on December 31st of the preceding year, and the number of inactive service lines abandoned during that year.

12.11.3.4 The Utility Supervisors shall:

a. Schedule and perform the abandonment of all confirmed inactive service lines listed in accordance with **§12.11.3.3.a.**

b. Complete and provide appropriate inactive service line abandonment records to Utility Engineering.

12.11.4 SCHEDULE FOR ABANDONMENT OF INACTIVE SERVICE LINES

12.11.4.1 The following inactive service lines shall be abandoned promptly:

a. Those located in, or close to, excavations.

b. Those located in, or close to, buildings being demolished.

c. Those discovered to be leaking.

d. Those that are unrecorded or previously unknown to exist and that are discovered during the course of leakage surveys, construction, maintenance, or inspection of the distribution system.

12.11.4.2 The following inactive service lines shall be abandoned not later than 10 years after their most recent designated inactivation date:

a. Plastic lines.

b. Cathodically protected steel lines that comply with 49 CFR 192.463 and 192.455(a)(1)(2).

12.11.4.3 All inactive service lines that do not meet the conditions or criteria set forth in **§§12.11.4.1** and **12.11.4.2** shall be abandoned not later than five years after their most recent designated inactivation date.

12.11.5 LOCATING THE SERVICE LINE TO BE ABANDONED

The location where the service line is connected to the gas main (i.e., the service tap) shall be identified by using one or more of the following methods:

12.11.5.1 A pipe locator to locate the service line from the Point-Of-Entrance (P.O.E.) at the building to the main.

12.11.5.2 The Service Database to determine the service line size and tap location.

12.11.5.3 The Service.Card to determine service size and tap location.

12.11.5.4 Paper Maps to determine service tap location. Elevated pressure services and low pressure services 3" and greater in diameter are sometimes plotted on the 1" = 40' scale plans.

12.11.5.5 For inside services, an attempt shall be made to enter the building and measure from the outside wall to the P.O.E. Then the P.O.E. measurement shall be used outside the building to determine the service tap location.

12.11.6 PHYSICAL CUT OFF AT THE MAIN

12.11.6.1 An excavation shall be made at the service tap location or as close as practical to the source of supply. The tee, main, and enough service pipe to cut a segment out of the service line shall be exposed.

12.11.6.2 Service lines on distribution systems with an MAOP of 15 psig or less

a. When possible, the plug shall be removed from the service tee and a stoppering device, rag, duct seal, or other approved device inserted to stop the flow of gas from the main or source of supply.

b. When **§12.11.6.2a.** is not possible, a segment shall be cut out of the service pipe and a stoppering device, rag, duct seal, or other approved device inserted in the end of the pipe toward the service tee to stop the flow of gas from the main or source of supply.

12.11.6.3 Service lines on distribution systems with an MAOP greater than 15 psig but not more than 100 psig

a. The cap on the service tee shall be removed and the punch tee plug turned down to stop the flow of gas from the main or source of supply.

b. If there is no punch tee, the cap or plug on the service tee shall be removed and the orifice pinned with a metal pin or wooden dowel: or a stoppering device shall be inserted to stop the flow of gas from the main or source of supply.

12.11.6.4 For All Service Lines

a. A segment of pipe shall be cut out of the service line at the main or source of supply.

b. Except for plastic service lines connected to plastic mains, the service tee shall be removed, when feasible.

c. The pressure source shall be immediately plugged with a permanent plugging device as follows.;

Low-Pressure Sources	Elevated-Pressure Sources
Threaded Plug	Saddle and Plug
Saddle and Plug	Full Seal Clamp
	Pin and Weld
	Threaded Plug

d. Depending upon the diameter and length of the service line, the line shall be purged with air and/or nitrogen. The criteria for main purging, as found in **§11.9**, shall be used.

e. If a curb box exists and is readily located, the cover should be removed and the box backfilled.

f. The open end of the abandoned service line shall be sealed near the main or source of supply.

12.11.7 ABANDONING SERVICE LINES IN CONJUNCTION WITH A MAIN ABANDONMENT

12.11.7.1 Inactive service lines connected to a main that is to be abandoned shall be identified by using one or more of the following resources:

a. Service Database File.

b. Service Card.

c. Inactive Services Report.

d. Physical inspection at the site.

12.11.7.2 When service lines are abandoned in conjunction with the abandonment of a main, the abandonment shall be performed in accordance with **§12.7.**

12.11.8 RECORD KEEPING

12.11.8.1 A Service installation/ Abandonment report and Service Card shall be completed for all service lines abandoned separately. The Service Report and Service Information Form should include a measurement to the point of disconnection at the main or other source of supply.

12.11.8.2 A Service installation/ Abandonment report and Service Card shall be completed for all service lines abandoned in conjunction with the abandonment of a main. Service installation/ Abandonment report and Service Card should only indicate that abandonment occurred with the main. No measurement to a point of disconnection shall be necessary because the service line was not cut off at or close to the main.

[REF.: 220 CMR 107; 49 CFR 192.455,192.463, 192.727]

12.12 NOTIFICATION PROCEDURE FOR THE TEMPORARY REMOVAL OF PEAK-SHAVING EQUIPMENT FROM SERVICE

12.12.1 PURPOSE

This section prescribes the notification procedure that shall be followed when peak-shaving equipment is temporarily removed from service for maintenance.

12.12.2 SCOPE

This section shall apply to non-emergency removal of peak-shaving equipment from

service. Notifications for emergency removals shall be conducted in accordance with §6.4 of the Department Emergency Plan.

12.12.3 GENERAL

12.12.3.1 When practicable, peak-shaving equipment maintenance should be performed during the non-heating season.

12.12.3.2 When practicable, peak-shaving equipment maintenance should be performed such that the peak-shaving facility undergoing maintenance remains operational (e.g., performing maintenance on one LNG vaporizer at a time).

12.12.4 NOTIFICATION PROCEDURE

12.12.4.1 Whenever peak-shaving equipment is to be removed from service for maintenance and it can not be returned to service within four hours, the appropriate Utility Supervisors shall be notified.

12.12.4.2 The appropriate Utility Supervisor shall then notify the following:

a. Operations Engineer

b. Operations Supervisor.

c. Operations Superintendent.

12.13 NOTIFICATION PROCEDURE FOR THE TEMPORARY SHUTDOWN OF A TAKE STATION

12.13.1 PURPOSE

This section prescribes the notification procedure that shall be followed when a take station is temporarily shutdown for maintenance and/or reconstruction.

12.13.2 SCOPE

This section shall apply to non-emergency shutdowns of take stations. Notifications for emergency shutdowns shall be conducted in accordance with §6.4 of the Department Emergency Plan.

12.13.3 GENERAL

When practicable, take station maintenance and/or reconstruction requiring a shutdown should be performed during the non-heating season.

12.13.4 NOTIFICATION PROCEDURES

12.13.4.1 Prior to the temporary shutdown of a take station for more than one day, the individual overseeing its shutdown shall notify Dispatch, as far in advance as possible.

12.13.4.2 The Utility Supervisor responsible for Gas Control, or designee, shall notify the personnel listed below. Notifications should be made in writing, at least one week in advance of the shutdown.,

a. Utility Supervisors.

b. Operations Engineer.

c. Operations Supervisor.

d. Dispatch.

e. Operations Superintendent.

f. Gas Supply Manager

12.13.4.3 Prior to the temporary shutdown of a take station for one day or less (e.g., routine maintenance), the individual overseeing its shutdown shall notify Dispatch. Dispatch shall notify the personnel listed in **§12.13.4.2**, as deemed necessary.

12.14 NOTIFICATION PROCEDURE FOR THE TEMPORARY SHUTDOWN OF A DISTRICT REGULATOR STATION

12.14.1 PURPOSE

This section prescribes the notification procedure that shall be followed when a district regulator station is shutdown for maintenance.

12.14.2 SCOPE

This section shall apply to non-emergency district regulator station shutdowns that last more than one day.

12.14.3 GENERAL

When practicable, district regulator station maintenance requiring a shutdown should be performed during the non-heating season.

12.14.4 NOTIFICATION PROCEDURES

12.14.4.1 Prior to the shutdown of a district regulator station for maintenance that is scheduled to last more than one day, the Utility Foreman, or designee, shall notify the following:

a. Utility Engineering.

b. Dispatch.

12.14.4.2 When a district regulator station shutdown, which is not scheduled to last more than one day, extends overnight, the

Utility Foreman, or designee shall notify Dispatch as soon as practicable.

12.14.4.3 Upon notification, the Dispatcher, or designee, shall notify the following, as deemed necessary:

a. All Dispatchers.

b. All Utility Supervisors.

c. Operations Engineer

d. Operations Supervisor..

12.15 INSPECTION, TESTING, AND MAINTENANCE OF DISTRICT REGULATOR STATIONS AND TAKE STATIONS

12.15.1 PURPOSE

This section prescribes the annual inspection, testing, and maintenance requirements for district regulator stations and take stations, and record keeping related thereto.

12.15.2 GENERAL

12.15.2.1 All district regulator stations and take stations shall be inspected and tested at intervals not exceeding 15 months, but at least once each calendar year.

12.15.2.2 The requirements of **§12.16** Vault Entry shall be followed for stations located in vaults.

12.15.2.3 Dispatch shall be notified when a district regulator station or a take station is being inspected, tested, and maintained under this section.

12.15.2.4 The upstream (inlet) pressure and the downstream (outlet) pressure of a district regulator station or a take station shall be monitored while the station is being inspected, tested, and maintained under this section.

12.15.2.6 Unless directed otherwise, after work is completed that required changing the normal operating position of any valve (i.e., open to closed or closed to open), each valve shall be returned to its normal operating position.

12.15.2.6 Under normal conditions, each station shall have two valve box covers, or the heads of two valves, if the valves are above ground, marked with paint. The primary (inlet) valve shall be marked in red, and an outlet valve shall be marked in blue.

12.15.3 INSPECTIONS

Each district regulator station and take station shall be inspected and corrective action or maintenance shall be undertaken, where indicated, to address the following:

12.15.3.1 Each vault or aboveground enclosure is free of a combustible atmosphere as determined by a CGI or equivalent leak detector equipment.

12.15.3.2 Vault covers and any station doors and gates are adequately accessible, free from obstructions, and functioning properly.

12.15.3.3 Vault covers or doors and valve boxes do not present a tripping hazard to the general public.

12.15.3.4 Any pressure recording instrument and pressure gauge is functioning properly.

12.15.3.5 Any ventilating duct for a vault is unobstructed.

12.15.3.6 Any regulator vent to the atmosphere is unobstructed by blowing the vent line out with air.

12.15.3.7 All valves in valve boxes are unobstructed, and the appropriate valve key fits properly on each valve.

12.15.3.8 Each valve is in the correct open or closed position in accordance with the district regulator station's flow sheet before any shutdown of the station is conducted.

12.15.3.9 The. critical valve (district regulator station inlet valve) box cover is painted red.

12.15.3.10 Each filter or strainer is functional.

12.15.3.11 Pilot control systems and other instrumentation are operating normally.

12.15.3.12 For weight-loaded regulators, bolts or studs that are fasteners for all joints above the diaphragm are not broken or damaged; and that the cover plate gasket is not deformed or damaged (see **§12.15.4.5**).

12.15.3.13 Metallic piping and components are protected against atmospheric corrosion (see **§8.12**).

12.15.3.14 The district regulator station flow sheets and schematics are correct.

12.15.4 TESTS

12.15.4.1 General

a. Each control and monitor regulator shall be tested to establish that the regulators are in good working order and set to function at the correct pressure. Any malfunction noted in the tests conducted in **§12.15.4.2** through **§12.15.4.5**, or any instability in a regulator's set point before it is taken out of service or after it is returned to service, shall be determined and corrected.

b. Maintenance personnel shall determine the cause of a malfunction or operational instability and assess whether to perform an internal inspection of the regulators components and subsequent adjustment, repair, or replacement of components, or the replacement of the entire regulator.

c. The proper operation of a regulator shall be verified after-any adjustment, repair, or replacement of a component or the regulator occurs.

12.15.4.2 Testing a Station That Is Completely Shutdown

a. General

1. The procedures in **§12.15.4.2** apply to a district regulator station with a control regulator and a wide-open monitor regulator or butterfly valve monitor that is completely shutdown or taken out of service to perform tests.

2. The procedures in **§12.15.4.2** do not apply to the following types of stations:

(a) Stations that have a regulator(s) with different sequential procedures than those provided in **§12.15.4.2**, such as the Fisher 399. In such instances, the regulator manufacturer's procedures for taking the regulators out of service shall be followed.

(b) Stations that have bypass piping that allows one regulator to be shutdown while the other regulator remains in operation (see **§12.15.4.3**).

(c) Stations with a working monitor regulator or a British Module regulator (see **§12.15.4.4**).

b. Taking the Control Regulator Out of Service

1. The control regulator's output shall be shut off by slowly lowering its set point (e.g., removing weights, backing off a regulator's spring).

2. If the pressure in the distribution system served by the district regulator station drops too low, as determined by the Utility Foreman, or designee on-site, the pressure loss shall be compensated for by:

(a) Raising the output of one or more district regulator stations in an integrated system;

(b) Activating the station's regulator bypass system (see **§11.14**);

(c) Completely bypassing the district regulator station (see **§ 11.14**); or

(d) Performing all inspections and tests, except the test for lock-up under **§12.15.4.2**, paragraphs d and e, below. The lock-up test shall be performed at a later date within the requirements and limitations of this section.

c. Butterfly Valve Monitor Testing

1. The outlet valve of the monitor regulator shall be closed.

2. The butterfly valve's pressure sensing line outlet valve shall be closed.

3. A separate service-type regulator setup with a pressure gauge shall be connected to the static pressure sensing line from an upstream pressure source.

4. A simulated or false pressure shall be established in the static pressure sensing line, using the test regulator in the preceding paragraph 3. The simulated pressure shall be just higher than the butterfly valve's normal setting.

5. The butterfly valve shall be fully stroked and its linkage observed. Repairs shall be made, if found necessary.

6. The simulated pressure at full stroke shall be recorded.

d. Lock-Up Test For Station With Wide-Open Upstream Monitor

1. The set point of the control regulator shall be lowered in accordance with **§12.15.4.2**, paragraph b, above.

2. The station's outlet valve shall be closed.

3. The pressure between the outlet valve and the control regulator shall be bled off. If there is no pressure build-up after bleeding off, lock-up of the control regulator has been achieved. If there is pressure build-up, it shall be determined whether the outlet valve or the control regulator is leaking by, and remedial action shall be initiated. Testing for lock-up shall be repeated after the remedial action has been completed.

4. The set point of the monitor regulator shall be lowered.

5. After lock-up of the control regulator has been achieved, the pressure between the control regulator and the monitor regulator shall be bled off. If there is no pressure build-up after bleeding off, lock-up of the monitor regulator has been achieved.

6. The station's inlet valve shall be closed.

7. The pressure between the inlet valve and the monitor regulator shall be bled off. If there is no pressure build-up after bleeding off, the valve is functioning properly. If there is pressure build-up, the valve is bleeding by and remedial action shall be initiated (e.g., greasing a plug valve).

e. Lock-Up Test For Station With Wide-Open Downstream Monitor

1. The set point of the control regulator shall be lowered in accordance with **§12.15.4.2**, paragraph b, above.

2. The station's outlet valve shall be closed.

3. The set point of the downstream monitor regulator shall be lowered.

4. The set point of the upstream control regulator shall be raised.

5. The pressure between the outlet valve and the monitor regulator shall be bled off. If there is no pressure build-up after bleeding off, lock-up of the monitor regulator has been achieved.

6. The set point of the control regulator shall be lowered.

7. After lock-up of the monitor regulator has been achieved, the pressure between the control regulator and the monitor regulator shall be bled off. If there is no pressure build-up after bleeding off, lock-up of the control regulator has been . achieved. If there is pressure build-up, it shall be determined whether the valve or the control regulator is leaking by, and remedial action shall be initiated. Testing for lock-up shall be repeated after the remedial action has been completed.

8. The station's inlet valve shall be closed.

9. The pressure between the valve and the control regulator shall be bled off. If there is no pressure build-up after bleeding off, the valve is functioning properly. If there is pressure build-up, the valve is bleeding by, and remedial action shall be initiated (e.g., greasing a plug valve).

f. Returning a Station With Wide-Open Monitor Regulator to Service

1. Verification shall be made that all loading, dump, and sensing lines have been activated.

2. The inlet valve shall be opened slowly, and then the outlet valve shall be opened slowly, before reactivating the station's regulators.

3. The control regulator's set point shall be raised to a pressure just higher than the monitor's normal set point (e.g., replacing weights or restoring a number of turns to compress the pilot regulator's spring).

4. The monitor regulator's set points shall be raised to the desired outlet

pressure (e.g., replacing weights or restoring a number of turns to compress a pilot regulator spring).

5. The control regulator's set point shall be lowered to maintain the desired outlet pressure.

12.15.4.3 Testing a Station When One Regulator Remains Operational While the Other Regulator Is Shutdown

a. General

1. The station's bypass system shall be used to ensure that one regulator is operational while the other regulator is being tested. (See**§11.14**.)

2. The order of testing the control regulator and the monitor regulator shall be discretionary.

b. Lock-Up Tests

1. Testing the Control Regulator

(a) The set point of the control regulator shall be raised to the set point of the monitor regulator.

(b) Whether the monitor regulator is located upstream or downstream of the control regulator, the correct bypass valve(s) shall be opened, as determined from the station's flow sheet, to allow the station's upstream pressure to be regulated through the monitor regulator directly into the station's outlet piping.

(c) The monitor regulator's set point may be lowered to prevent excessive distribution system pressure build-up.

(d) The outlet valve of the control regulator shall be closed.

(e) The set point of the control regulator shall be completely lowered.

(f) Verification shall be made that there is continuous pressure on the inlet side of the control regulator.

(g) The pressure between the control regulator and its outlet valve shall be bled off. If there is no pressure build-up after bleeding off, lock-up of the control regulator has been achieved. If there is pressure build-up, it shall be determined whether the valve or the control regulator is bleeding by, and remedial action shall be initiated. Testing for lock-up shall be repeated after the remedial action has been completed.

(h) The inlet valve to the control regulator shall be closed.

(i) The pressure between the inlet valve and the control regulator shall be bled off. If there is no pressure build-up after bleeding off, the valve is functioning properly. If there is pressure build-up, the valve is bleeding by, and remedial action shall be initiated (e.g., greasing a plug valve).

(j) The control regulator shall be returned to service, as follows:

(1) The inlet block valve to the control regulator shall be opened.

(2) The outlet block valve to the control regulator shall be opened.

(3) The control regulator shall be fully opened by raising its set point.

(4) The monitor regulators set point shall be adjusted to the desired pressure.

(5) The control regulator's bypass valve(s) shall be closed.

(6) The control regulator's set point shall be lowered to the desired pressure.

2. Testing the Monitor Regulator

(a) The correct bypass valve(s) shall be opened, as determined from the station's flow sheet, to allow the station's upstream pressure to be regulated through the control regulator directly into the station's outlet piping.

(b) The outlet valve of the monitor regulator shall be closed.

(c) The monitor regulator shall be fully closed by lowering its set point.

(d) The pressure between the outlet valve and the monitor regulator shall be bled off. If there is no pressure build-up after bleeding off, lock-up of the monitor regulator has been achieved.

(e) The inlet valve to the monitor regulator shall be closed.

(f) The pressure between the valve and the regulator shall be bled off. If there is no pressure build-up after bleeding off, the valve is functioning properly. If there is pressure build-up, the valve is bleeding by, and remedial action shall be initiated (e.g., greasing a plug valve).

(g) The monitor regulator shall be returned to service:

(1) The inlet block valve to the monitor regulator shall be opened.

(2) The outlet block valve the monitor regulator shall be opened.

(3) The monitor regulator shall be fully opened by raising its set point.

(4) The monitor regulators bypass valve(s) shall be closed.

(5) The control regulator's set point shall be raised just above the monitor regulator's set point.

(6) The monitor regulator's set point shall be lowered to the desired pressure.

(7) The control regulator's set point shall be lowered to the desired pressure.

12.15.4.4 Lock-Up Test For Working Monitor Regulator Stations and British Module Regulator Stations

Lock-up tests for district regulator stations with working monitor regulators or British Module regulators shall be performed in accordance with specific procedures for those stations set forth, as needed, by the Utility Supervisor or designee.

12.15.4.5 Pressure Test of Access Cover and Vent Line for Weight-Loaded Regulators

a. It shall be ensured that all bolts or studs for all joints above the diaphragm are not broken or damaged, and that the cover plate gasket is not deformed or damaged.

b. The test below shall be performed on the monitor regulator first, and then on the control regulator:

1. The access cover to the weights and the vent line connected thereto for weight-loaded regulators located in vaults shall be tested for tightness by applying Y2psig of air pressure to the vent line and the chamber under the cover.

2. All joints above the diaphragm, and vent line connections located within the vault, shall be soap tested. Any leak discovered shall be eliminated and the test shall be repeated to verify the adequacy of any repair that was made.

12.15.5 RELIEF VALVES AT DISTRICT REGULATOR STATIONS OR TAKE STATIONS

12.15.5.1 Relief valves at district regulator stations and take stations shall not be tested by actual operation.

12.15.5.2 The capacity of each relief valve shall be reviewed and calculated by Utility Engineering within the time period set forth in **§12.15.2.** 1. Subsequent calculations shall not be required if the review determines that parameters have not changed.

12.15.5.3 If a relief valve has insufficient capacity, as calculated under **§12.15.5.2**, a larger or additional relief valve or other pressure limiting device with sufficient capacity shall be installed.

12.15.6 RECORD KEEPING

12.15.6.1 A record for each station shall be kept on file, which should include the following:

a. The inspections, tests, maintenance, and adjustments performed.

b. The upstream and downstream pressure readings before and after any of the work is performed under the preceding paragraph a, above.

c. The final set point of each regulator after the completion of any work at a station.

12.15.6.2 A record for each station shall be maintained indicating the size, model, and pressure rating of the primary and monitor regulators and relief valves.

12.15.6.3 A diagram for each station shall be maintained showing the following:

a. The direction of gas flow.

b. The position of valves during normal operation (i.e., open or closed).

c. The critical valve.

d. Measurements to the valves that will identify their approximate physical locations, where necessary.

e. Control lines.

12.15.6.4 The Inspection Report shall be completed and submitted to Utility Engineering for review and filing.

12.15.6.5 Utility Engineering shall maintain documentation regarding the review and calculations for relief valves specified under **§12.15.5.2**.

12.15.6.6 A review of regulator maintenance records shall be performed by the Operations Engineer, or designee, to identify trends or areas of concern that may require increased inspection frequencies or other appropriate action to ensure the safe and reliable operation of pressure control devices.

[REF.: 49 CFR 192.181, 192.739, 192.743(b)]

12.16 VAULT ENTRY

12.16.1 PURPOSE

This section describes the requirements of Department employees or its agents before entering and while occupying a vault, manhole, or pit.

12.16.2 DEFINITIONS

12.16.2.1 *Department Vault Entry.* When a Department vault is entered to perform normal or routine work, such as checking a district regulator. A Department vault may contain a meter, a shutdown valve, an odorizer, or other pipeline facility.

12.16.2.2 *Emergency Vault Entry*: When a Department vault is entered which contains a hazardous atmosphere as set forth in **§12.16.8.1**.

12.16.2.3 *Leak Investigation Vault Entry.* When a Department vault, or a vault owned or operated by others, is entered to perform a gas leak investigation.

12.16.2.4 *Vault* An underground structure with an enclosed space that may be occasionally occupied by a person performing work. The space is normally closed to the outside atmosphere by a door or manhole cover, which is normally located at a horizontal grade level.

12.16.3 GENERAL

12.16.3.1 Any test performed to determine the presence of combustible gas, oxygen, and carbon monoxide shall be performed with properly calibrated detection equipment.

12.16.3.2 Before a vault is entered, a fire extinguisher shall be placed on the ground in close proximity to the vault.

12.16.3.3 When a vault's door is opened or cover removed, the opening shall be guarded, barricaded, or protected in a manner to decrease the possibility of a person accidentally falling into the vault.

12.16.3.4 While a vault is occupied, its atmosphere shall be continuously monitored for combustible gas, oxygen level, and the presence of carbon monoxide. Instrument alarms shall be set at 10% LEL, 19.5% oxygen, and 35 to 200 ppm carbon monoxide. The vault shall be vacated immediately upon an alarm signal.

12.16.3.5 Forced ventilation in a vault shall not be required as long as the monitored atmospheric conditions in **§12.16.3.4** have not caused an alarm signal.

12.16.4 SAFETY EQUIPMENT FOR VAULT ENTRY

An employee shall have the following equipment available to support safe entry and occupancy in vaults. Employees shall be trained in the use of the appropriate equipment that is needed to perform their work.

12.16.4.1 Instrument(s) for testing and monitoring the atmosphere in vaults.

12.16.4.2 Air blower to ventilate vaults.

12.16.4.3 Fire-retardant suit(s) or clothing.

12.16.4.4 Safety harness with a flame-retardant lifeline. (The safety harness may be an integral part of the fire-retardant suit.)

12.16.4.5 Hoist capable of lifting a person from a vault.

12.16.4.6 Fully-charged SCBA.

12.16.4.7 Fire extinguisher.

12.16.4.8 Vault guard, fence, barricade, or other protective or warning device(s).

12.16.4.9 Hard hat(s).

12.16.5 TESTS PERFORMED BEFORE ENTRY INTO ANY VAULT

12.16.5.1 A test for the presence of combustible gas shall be performed just below the vault's door or cover by inserting a CGI's probe through an available opening. Where there is no opening, the door or cover shall be lifted just enough to insert the probe.

12.16.5.2 The door(s) or cover(s) shall be fully opened. If the reading obtained in **§12.16.5.1** was 10% LEL or greater, the vault shall be allowed to naturally ventilate for at least five minutes before proceeding with further tests.

12.16.5.3 From above ground, the CGI's probe shall be used to test the vault's atmosphere at about four feet below the door or manhole cover, and, if practical, at other locations where gas may accumulate in the vault.

12.16.5.4 From above ground, a multiple-gas monitoring instrument shall be used to test the vault's atmosphere at about three feet above the vault's floor for combustible gas, oxygen, and carbon monoxide.

12.16.5.5 If the combustible gas reading is 10% LEL or more, the oxygen reading is less than 19.5%, and/or the carbon monoxide reading is 200 ppm or more, forced ventilation shall be used to attain readings of less than 10% LEL for combustible gas, of 19.5% oxygen or more, and less than 200 ppm of carbon monoxide. When such readings cannot be attained, the entry into the vault shall be considered an Emergency Vault Entry, and the procedures under **§12.16.8** shall be followed.

12.16.5.6 All pre-entry test readings shall be recorded before any person enters a vault. Subsequent tests may also be recorded.

12.16.6 DEPARTMENT VAULT ENTRY

12.16.6.1 A vault may be entered without a SCBA or forced ventilation, provided all of the following conditions exist:

a. The CGI reading is less than 10% LEL.

b. The oxygen level reading is at least 19.5%.

c. The carbon monoxide reading is less than 200 PPM-

12.16.6.2 While the vault is occupied, its atmosphere shall be continuously monitored in accordance with **§12.16.3.4** and vacated immediately upon an alarm signal.

12.16.6.3 A vault may be entered when forced ventilation is required to meet the conditions set forth in **§12.16.6.1**, provided that the forced ventilation remains in operation while the vault is occupied. The requirements of **§12.16.6.2** shall be followed.

12.16.6.4 When forced ventilation is required, at least one person shall remain above ground and shall maintain visual or audible contact with the person(s) in the vault until the vault is vacated.

12.16.7 LEAK INVESTIGATION VAULT ENTRY

12.16.7.1 Only personnel designated by each Utility Supervisor, Operations Engineer, or Operations Supervisor, or designee, shall enter a vault for leak investigation.

12.16.7.2 No Department personnel shall enter a vault owned or operated by another Company, unless access is provided and approved by an employee of that Company authorized to grant such access. When performing a leak investigation, the Department employee shall follow this section and the procedure of the other Company, where more stringent.

12.16.7.3 The duration of occupancy in a vault shall not exceed the amount of time to perform the leak investigation and eliminate or mitigate the cause of the leak, if one is found.

12.16.7.4 A vault may be entered and occupied without a SCBA, provided the atmospheric conditions under **§12.16.6.1** exist within the vault and the procedures under **§§12.16.6.2**, **12.16.6.3**, and **12.16.6.4** are followed.

12.16.8 EMERGENCY VAULT ENTRY

12.16.8.1 Entry of a Department vault shall be considered an Emergency Vault Entry when one or more of the following conditions exist:

a. The CGI reading is 10% LEL or more.

b. The oxygen reading is less than 19.5%.

c. The carbon monoxide reading is 200 ppm or more.

12.16.8.2 An Emergency Vault Entry should be performed only when approval for entry has been granted by a Utility Supervisor, or designee.

12.16.8.3 Only personnel designated by the Operations Engineer or Operations Supervisor, or designee, shall perform an Emergency Vault Entry.

12.16.8.4 At least one person shall remain above ground and shall maintain visual or audible contact with the person(s) in the vault until the vault is vacated.

12.16.8.5 An employee performing an Emergency Vault Entry shall:

a. Wear a fire-retardant suit or clothing

b. Wear a safety harness with a flame-retardant lifeline attached thereto.

c. Use a fully-charged SCBA.

12.16.8.6 The lifeline referred to in **§12.16.8.5(b)**. shall extend above ground. At least one person shall be continuously present above ground while the employee is in the vault; and the person(s) shall be capable of lifting the employee from the vault with a hoist.

12.16.8.7 The duration of occupancy in the vault shall not exceed the capacity of the SCBA to support life.

12.16.8.8 A SCBA that has been used shall be fully recharged as soon as practicable.

12.17 INSPECTION AND MAINTENANCE OF CRITICAL VALVES

12.17.1 PURPOSE

This section describes the inspection and maintenance requirements of valves designated as critical valves.

12.17.2 GENERAL

12.17.2.1 Inspection and maintenance of critical valves shall be performed at intervals not exceeding 15 months, but at least once each calendar year.

12.17.2.2 The permanent record for each critical valve shall include the location of the valve. When available, the record for each critical valve should include the direction and number of turns to fully open or close, size, type, depth of cover, and the manufacturer.

12.17.2.3 Inlet valves associated with distribution regulator stations shall be considered as critical valves, and inspected and maintained by Operations Personnel (see **§ 12.15**).

12.17.2.4 The annual inspection of the listed critical valves shall be the responsibility of Utility Supervisors.

12.17.2.5 Critical valves shall be partially operated and returned to their original position.

12.17.3 PROCEDURE

12.17.3.1 The valve shall be located using the location dimensions from Department records (i.e., the Critical Valve Book or the regulator station flow diagram). The dimensions shall be verified to ensure that the correct valve is located.

12.17.3.2 The valve shall be checked for accessibility to minimize the time to locate and operate them during emergencies. The valve box shall be cleared of any debris that might interfere with or delay the operation of the valve, and shall be adjusted to grade, as necessary.

12.17.3.3 For critical valves in valve boxes, the valve box shall be checked for gas leakage using a CGI. Exposed critical valves shall be leak tested (e.g., soap bubble test) during the annual inspection. If leakage is detected, the valve shall be scheduled for repair.

12.17.3.4 The valve shall be checked for correct alignment to allow proper use of an operating key or wrench.

12.17.3.5 All valves equipped with a lubricating fitting shall be lubricated, as necessary.

12.17.3.6 The depth of cover from existing grade to the top of operating nut shall be checked using a measuring tape.

12.17.3.7 The outside cover and the inside rim of the valve box shall be painted red for regulator station critical valves and yellow for all other distribution system critical valves.

12.17.4 DOCUMENTATION

12.17.4.1 The following information shall be recorded on the Critical Valve Annual Inspection Sheet:

a. Date that the inspection was completed.

b. Valve Greased - "YES", "NO", or "NOT APPLICABLE"

c. Valve Operated - "TOTAL", "PARTIAL", or "Not OPERATED"

d. Name of person conducting the inspection.

e. CGI Check - % gas or "NONE"

f. Comments - Enter any comments (e.g., the actual depth of cover, if different from the information shown).

g. Corrective Action Taken

12.18.4.2 Utility Supervisors shall forward written documentation of each critical valve inspection to Utility Engineering for processing. This should include a copy of the Critical Valve Annual Inspection Sheet.

[REF.: 49 CFR 192.747]

12.18 INSPECTION AND MAINTENANCE OF SERVICE LINE VALVES

12.18.1 PURPOSE

This section describes the inspection and maintenance requirements of underground service line valves identified as prone to becoming not easily and immediately accessible and designated as

a. Located on intermediate or high pressure services, or

b. Two inch or greater in diameter, or

c. Servicing a theater, church, school, factory or other building where a large number of persons congregate.

12.18.2 DEFINITIONS

12.18.2.1 *Easily and Immediately Accessible*: Accessible without having to remove paving material.

12.18.2 GENERAL

12.18.2.1 Typically, service valves are installed in such locations that eliminate their inclusion in this section. This is accomplished by the installation in areas that is is unlikely to be paved over.

12.18.2.2 Inspection and maintenance of service line valves described in §12.18.1(c) shall be performed at intervals not exceeding 15 months, but at least once each calendar year. Inspection and maintenance of all other service line valves applicable to this section shall be performed at intervals not exceeding 10 years, with no less than 10% of those valves inspected in any one calendar year.

12.18.2.3 The permanent record for each service valve shall include the location of the valve.

12.18.2.4 Utility Engineering shall determine service line valves to be inspected. A work order shall be generated and forwarded to the appropriate Utility Supervisor

12.18.2.5 The Utility Supervisor shall coordinate the annual inspection of the identified valves.

12.18.3 PROCEDURE

12.18.3.1 The valve shall be located using the location dimensions from Department records (i.e., the service card). The dimensions shall be verified to ensure that the correct valve is located.

12.18.3.2 Service line drawings shall be drawn for all valves that do not have a service card and returned to Utility Engineering.

12.18.3.3 The valve shall be checked for accessibility to minimize the time to locate and operate them during emergencies. The valve box shall be cleared of any debris that might interfere with or delay the operation of the valve, and shall be adjusted to grade, as necessary.

12.18.3.4 The valve shall be checked for correct alignment to allow proper use of an operating key or wrench.

12.18.3.5 The outside cover and the inside rim of the valve box shall be painted yellow.

12.18.4 DOCUMENTATION

12.18.4.1 The following information shall be recorded on the Service Valve Inspection Sheet:

a. Date that the inspection was completed.

b. Name of person conducting the inspection.

c. Comments - Enter any comments (e.g., the actual depth of cover, if different from the information shown).

d. Corrective Action Taken

12.18.4.2 Utility Supervisors shall forward written documentation of each service valve inspection to Utility Engineering for processing. This should include a copy of the Service Valve Inspection Sheet.

[REF.: 220 CMR 101.06 (14)(a)]

12.19 PROPER IDENTIFICATION AND OPERATION OF MAIN AND SERVICE LINE VALVES

12.19.1 PURPOSE

This section describes the procedure for properly identifying main and service valves prior to their operation.

12.19.2 REQUIREMENT

Prior to operating a main or service valve, a distribution system plan, or a copy of the appropriate service card, should be used to identify the valve; or the valve shall be identified in the field using a pipe locator or a box finder.

12.19.3 VALVE OPERATION PREPARATION

12.19.3.1 Once the correct valve has been identified and located, the valve box shall be cleaned out, if necessary. The operating nut, if it is a quarter-turn valve with no valve operator, shall be visually inspected to determine its position. The position of the alignment marks shall be noted for its existing position (i.e., open or closed).

12.19.3.2 The alignment marks indicate the opened or closed position of the valve. If the marks are in line with the pipe, the valve is in the open position. If the marks are at 90 degrees to the pipe, the valve is in the closed position.

12.19.3.3 There are two types of valves used in the distribution system, ¼ turn plug valves with and without valve operators, and multi-turn valves, such as gate or butterfly valves.

12.19.3.4 The type of valve and the number of turns required to operate it should be determined, where feasible, prior to its operation by referring to the appropriate plans or records.

12.19.4 VALVE OPERATION

12.19.4.1 Once the valve has been identified, an appropriate wrench (e.g., gate key) shall be used to open or close the valve.

12.19.4.2 Valves equipped with lubrication fittings should be lubricated prior to operation.

12.19.4.3 Normally, main and service valves close clockwise and open counter-clockwise. However, there are "right-hand" valves in use that open clockwise and close counter-clockwise.

12.19.4.4 A multi-turn valve requires a specific number of turns to open and close. The number of turns varies with the valve operator, and the size and type of valve. Main notes and distribution system plans should be used to determine the number of turns to open or close a multi-turn valve.

12.19.4.5 To aid in counting the number of turns, a paint or chalk mark should be placed on the ground surface adjacent to the valve box, and the location where the valve wrench corresponds to the surface mark noted.

12.19.4.6 The valve shall be operated the correct number of turns (1/4 or multiple turns) to open or close it. Note full turns to ensure the valve is fully operational.

12.19.4.7 Before re-closing or re-opening a valve, ensure that it was fully opened or closed (by noting its current operating position), and note the number of turns to re-operate.

12.19.4.8 If the valve fails to stop the flow of gas through the pipeline being worked on, your supervisor shall be notified and immediate corrective action shall be taken to

avoid compromising public safety and to limit the impact to the distribution system.

12.19.4.9 A main valve shall only be re-opened when work on the pipeline has been completed.

12.19.4.10 When working on a service valve where the gas flow is to be shut off, the building(s) served shall be entered to ensure that the inside piping is gas tight. The building(s) shall be entered, and the inside checked for gas leakage, to ensure that service is properly re-established.

12.19.4.11 Valves found in a closed position shall only be operated with supervisory approval.

12.20 ENSURING VALVE ACCESSIBILITY

12.20.1 PURPOSE

This section describes the procedures to ensure that gas distribution and service valves are easily and immediately accessible.

12.20.2 DEFINITIONS

12.20.2.1 *Easily and Immediately Accessible*: Accessible without having to remove paving material.

12.20.3 IDENTIFICATION

12.20.3.1 Utility Engineering shall identify paving projects within the service territory each year, through contact with City of Westfield Engineering officials.

12.20.3.2 Identification may be accomplished through the following methods:

a. Direct contact

b. Open meeting

c. Notice of paving

d. Review of the City's Paving schedule on its web site.

12.20.3.3 Utility Engineering shall prepare work orders to raise the valve box for those valves that are identified as being within the scope of a pavement job and forward to the appropriate Utility Supervisor.

12.20.4 SCHEDULING

12.20.4.1 Utility supervisor shall schedule the valve box raising, in coordination with the paving contractor and/or City Engineering officials.

12.20.4.2 The Utility Supervisor should schedule valve box raising prior to the paving operation.

12.20.4.3 If the Utility Supervisor is unable to schedule th work prior to paving, he shall schedule the valve boxes to be raised the next business day following the paving..

12.20.5 VERIFICATION

12.20.5.1 Following the paving, the Utility Supervisor shall verify each affected valve is easily and readily accessible and coordinate inspection and maintenance on each affected valve in accordance with **§12.17** and **§12.18.**

12.20.6 RECORDKEEPING

12.20.6.1 The Utility Supervisor shall ensure that a Daily Field Report is completed for each location in which valve boxes are raised

12.20.6.2 The completed report shall be forwarded to the appropriate Administrative Assistant for recordkeeping.

[REF.: 164 MGL 116B]

12.21 RAISING VALVE BOXES

12.21.1 PURPOSE

This section prescribes the requirements for raising valve boxes to the final grade, in an area subjected to street reconstruction or resurfacing.

12.21.2 SCOPE

This section shall apply to all service, main, critical, and district regulator station valve boxes.

12.21.3 PROCEDURE

12.21.3.1 Valves in the main and service segments in question should be located, using the latest distribution system maps and records.

12.21.3.2 Valves shall be checked for gas leakage with a CGI; those found leaking shall be scheduled for repair. The repair should be made before the street is resurfaced.

12.21.3.3 Any debris found within a valve box shall be removed.

12.21.3.4 Each valve box shall be checked and adjusted, if necessary, to allow for the use of the appropriate operating key.

12.21.3.5 The valve box shall be adjusted or extended (e.g., box adapter), and anchored

so that it is at the new final grade. Final grade information is usually available at on-site meetings, or in the written notification.

12.22 VALVE REPAIR/REPLACEMENT

12.22.1 PURPOSE

This section describes the procedure for repairing or replacing distribution system valves in accordance with accepted practices.

12.22.2 VALVE REPAIR

All valves to be repaired shall be done in accordance with one of the following methods:

12.22.2.1 To repair a leak at a valve packing gland, approved packing material shall be used. The correct width of packing shall be determined. The old material shall be removed and replaced with the approved new packing. Where applicable, refer to the manufacturer's specifications.

12.22.2.2 Plug valve leak by may be sealed by injecting an approved sealant through an external grease fitting. Sealant may be injected manually, by handgun or by hydraulic grease gun.

12.22.2.3 Valve body leaks on systems having an MAOP of 25 psig or less may be permanently sealed by encapsulating the body. A special muff shall be designed that conforms to the nominal measurements of the valve.

12.22.3 VALVE REPLACEMENT

All valves shall be replaced in accordance with the following:

12.22.3.1 The nominal size of the replacement valve shall be determined by Utility Engineering.

12.22.3.2 An approved valve shall be used for replacement of the existing valve.

12.22.3.3 Utility Engineering should be contacted regarding bypass requirements, and the need to replace the valve.

12.22.3.4 The valve shall be cut out and replaced in accordance with accepted Department practices.

12.22.3.5 The valve operating nut shall be left accessible from street grade by using an approved valve box.

12.22.4 VALVE GEAR REPLACEMENT

The replacement gear shall meet or exceed the valve manufacturer's specifications, if known.

12.23 CAST-IRON PIPE -GENERAL

12.23.1 PURPOSE

This section prescribes operating pressure limits for distribution systems with cast-iron pipe and general requirements for the sealing (i.e., repair) of cast-iron joints.

12.23.2 OPERATING PRESSURE

Systems containing cast-iron pipe shall not normally be operated at pressures of 25 psig or greater.

12.23.3 CAST-IRON JOINT SEALING

12.23.3.1 Each caulked bell and spigot joint that is partially or entirely exposed for any reason, except for main abandonment, shall be sealed or clamped immediately with a Department-approved material, process, or device (e.g., encapsulation, anaerobic sealing, clamp), provided:

a. The personnel present at the site are:

1. Qualified and equipped to seal or clamp the joint.

2. Not reassigned (e.g., response to an emergency).

b. Physical conditions at the site allow immediate sealing or clamping.

c. Environmental conditions (e.g., weather, temperature) allow immediate sealing or clamping,

d. The exposed joint has not been previously sealed or clamped; or if sealed or clamped, determined to be leaking.

12.23.3.2 If personnel are not qualified, personnel who are qualified and equipped shall be requested to seal or clamp the exposed joint promptly.

12.23.3.3 If personnel are qualified, but not equipped to seal or clamp the exposed joint, they shall obtain the equipment and seal or clamp the exposed joint promptly.

12.23.3.4 If personnel are reassigned before sealing or clamping the exposed joint, the excavation shall be secured, and the exposed joint shall be scheduled to be sealed or clamped promptly.

12.23.3.5 If physical or environmental conditions do not allow the exposed joint to be sealed or clamped immediately, the excavation shall be secured, and the exposed joint shall be scheduled to be sealed or clamped promptly.

12.23.3.6 The exposed joint shall not be backfilled until it is sealed or clamped, unless existing conditions warrant, and the appropriate field operations supervisor approves, backfilling. Each backfilled joint shall be scheduled for re-excavation to be sealed or clamped promptly.

12.23.3.7 The exposed joint should be tested for leakage before being sealed or clamped, and shall be tested for leakage afterwards. If leakage continues to exist, further corrective action shall be taken.

[REF.: 49 CFR 222.753, DTE 99-PL-22]

12.24 CAST-IRON PIPE REPLACEMENT AND ABANDONMENTPROGRAM

12.24.1 PURPOSE

The Department shall replace or abandon cast-iron pipe on a regular basis. The Cast-iron Pipe Replacement and Abandonment Program ("CI Program") is a plan that has been developed, in part, to comply with 220 CMR 113.00: Operation, Maintenance, Replacement, And Abandonment Of Cast-iron Pipelines.

12.24.2 GOALS OF THE CI PROGRAM

12.24.2.1 The two main goals of the CI Program are to identify and address the following:

a. Those mains which have demonstrated the most maintenance and leak history, particularly main breaks and;

b. Those mains which are more likely to break in the future due to full depth street reconstruction or proximity to utility construction.

12.24.2.2 Through analysis of five elements, presented in **§12.24.4**, candidates shall be prioritized such that these goals are effectively met.

12.24.3 GENERAL

12.24.3.1 The CI Program shall be reviewed and modified whenever it is determined necessary by the Operations Engineer. However, a review of the CI Program shall be conducted at least once each calendar year.

12.24.3.2 Cast-iron pipe has been categorized by size and age. This information is included in Main Database.

12.24.3.3 All cast-iron pipe having a nominal diameter of 8" or less, that is known or has been determined to have been installed before 1860, shall be replaced prior to April 12, 1991.

12.24.3.4 Normal Department operations, such as, but not limited to, repair of joint leaks and breaks, service installations or abandonment's, and main extensions or branch connections shall not be required to be prioritized and scheduled in accordance with the CI Program and procedures required under 220 CMR 113.05. However, the Department shall consider the observations and/or reports made when such work is undertaken and cast-iron pipe is exposed. Main repairs shall be documented within the Department's Leak Management System and this information shall be used to evaluate future replacement candidates.

12.24.3.5 Cast-iron main replacements required by 220 CMR 113.06 at trench crossings by 3rd-party excavators and by 220 CMR 113.07 at locations adjacent to parallel excavations shall not be documented within the Leak Management System unless a leak occurs as a result of the construction. However, the Department shall consider the observations and/or reports made when such work is undertaken and reports made when cast-iron pipe is exposed.

12.24.3.6 The written time schedules for replacement or abandonment of cast-iron pipe shall include, as practicable, the size, length and location of pipe segments to be replaced or abandoned for each of the next three consecutive calendar years, when practicable.

12.24.3.7 The following records shall be maintained by the Department for at least five consecutive years after the calendar year to which the records apply:

a. Facility Investigation Report

b. Cast-iron Main Retirements by Age

c. Leak History

12.24.3.8 Appropriate operating, maintenance, supervisory and engineering personnel shall be trained initially and on a continuing basis at intervals of not more than two years. This training shall be conducted by the Operations Engineer and shall include the following:

a. The general requirements of 220 CMR 113.00.

b. The program and procedures developed to comply with 222 CM R 113.

c. Appropriate operating and maintenance plans or procedures adopted to meet the requirements of 49 C.F.R. Part 222 pertaining to cast-iron pipe.

12.24.3.9 Appropriate engineering and operating personnel shall be trained, as needed, but at intervals of not more than two years, regarding the methodology for selecting, prioritizing, and scheduling cast-iron pipe for replacement or abandonment. This training shall be conducted by Utility Engineering when changes in methodology or personnel occur (see **§11.2.3.3**).

12.24.4 THE CAST-IRON PROGRAM

The CI Program consists of five interactive planning components or elements which, when combined, establishes the amount and schedules of cast-iron pipe to be replaced or abandoned. Elements 1 through 4 pertain to normal Department operations. Replacement candidates identified based on these criteria are, therefore, prioritized and scheduled as a group (see **§12.24.6**). Element 5 pertains to 3rd-party construction projects, which is greatly impacted by the activities of outside agencies. Cast-iron candidates in this category are replaced in accordance with 220 CMR 113.06 and 113.07 (see **§12.24.5**).

12.24.4.1 ELEMENT 1: Elevated Pressure Cast Iron

a. Element 1 addresses small diameter cast-iron pipe that operates at a pressure above 2 psig.

b. Using Departmental database and other available records it may have for cast-iron mains 6" or less in diameter, Utility Engineering shall identify and schedule such mains for replacement, abandonment, or reduction in operating pressure.

c. These mains shall be scheduled for replacement or abandonment when it is cost-effective to do so; that is, when the street is no longer under guarantee and/or the work can be done in conjunction with other planned construction.

12.24.4.2 ELEMENT 2: Maintenance and Leak History

Element 2 shall be addressed by Utility Engineering and Utility Supervisors.

a. *Utility Engineering:* This group shall access a computerized file of leak information contained in the Field Report Database. The database tables can be polled to identify main segments having multiple breaks and/or leaks. This method shall be used to identify replacement candidates having the most leak maintenance history. An empirical method, referred to as the Base Index, shall also be used to assist in the identification of candidates for replacement. The Base Index is a calculation which weighs the relative importance of various factors. These factors include the number of breaks, joint leaks, active leaks, pipe size and vintage, operating pressure and planned paving. While the frequency of main breaks is considered most important in evaluating potential candidates, use of the Base Index allows expansion of the analysis to assess and weigh other Elements.

12.24.4.3 ELEMENT 3: Street Reconstruction

The Operations Superintendent shall solicit information from the city regarding schedules for full-depth street reconstruction. In cases where pending full-depth street reconstruction has been verified, the cast-iron mains shall be submitted to Utility Engineering for review. Where appropriate, cast-iron pipe 6" in diameter or less shall be replaced without further substantiation. Otherwise, those mains with a greater weighted leak history shall be replaced. In such cases, the pending street reconstruction shall serve as an additional consideration which may elevate the candidate to a higher priority. An effort shall be made to incorporate street reconstruction projects into the cast-iron replacement program.

12.24.4.4 ELEMENT 4: Other Considerations

Other elements include, but are not necessarily limited to, replacement due to insufficient capacity of a pipeline to transport the gas load, abandonment of a redundant main (i.e., a second main on the same street), and the replacement or abandonment of pre-2260 cast-iron mains (see **§12.24.3.4**).

a. *Insufficient Capacity.* Utility Engineering, Field Operations, or Dispatch shall initiate action for replacement of mains when load growth, pressure records, customer service calls or other data indicate cast-iron mains may have insufficient capacity. Utility Engineering shall conduct system analyses accordingly.

b. *Redundant Main:* Replacement of a redundant main shall be discretionary. A request for the replacement or abandonment of a redundant main shall consider variables that include those in the aforementioned Elements, the configuration and design of the street in which the main is located, the capacity of both mains in the street, and the service purpose of each main therein.

12.24.4.5 ELEMENT 5: Encroachment

Element 5 involves repair, replacement, abandonment or relocation of pipelines as a result of construction undertaken in the vicinity of cast-iron mains by persons other than the Department; that is, 3rd-party construction, which includes developers, engineering firms, building or construction contractors, and Mass Highway and City of Westfield Departments of Public Works (DPW). Element 5 addresses planned and unplanned Department projects precipitated by 3rd-party construction. If a main is to be replaced, whether the project is planned or unplanned, Utility Engineering shall review the proposed replacement to ensure the main is of adequate capacity.

a. *Planned Projects:* The Operations Superintendent shall solicit information from DPWs and other state and municipal agencies regarding proposed construction projects, including street re-pavements, street full-depth construction and relocations, sewer and water installations, and other special projects. In addition, plans are received from private 3rd parties. The proposed 3rd-party construction projects may involve excavations parallel to or crossing cast-iron mains. The 3rd-party construction plans shall be reviewed to determine what impact, if any,. the proposed construction will have on Department facilities. Subsequently, the Department shall determine whether to replace such lines and may, at that time, issue authorization to do so. Where appropriate, the Operations Superintendent shall negotiate design changes and/or reimbursement with the agency responsible for the project in order to minimize replacement or relocation of the gas lines.

b. *Unplanned Projects:* These projects are usually classified as damage prevention replacement projects. Normally, they are precipitated by Dig Safe Notifications received from 3rd-party excavators or upon marking out of the gas pipelines, which indicate that Department facilities will conflict with the 3rd-party construction. Utility Engineering should initiate replacement or other actions required based on observed field conditions.

12.24.5 CODE COMPLIANCE WITH THIRD-PARTY EXCAVATIONS

12.24.5.1 Replacement at Trench Crossings

a. Operating personnel shall identify cast-iron mains that have been impacted by 3rd-party trench crossings and meet the criteria set forth in 220 CMR 113.06: "Replacement of Cast-Iron Pipe at Trench Crossings", paragraph (1), which includes trench and gas main specifications. These mains shall then be submitted to Utility Engineering for review and authorization for replacement.

b. The replacement shall be at least for the length of pipe specified in §113.06, paragraph (2).

12.24.5.2 Replacement Adjacent to Parallel Excavations

a. Authorization shall be issued for the replacement of cast-iron mains that are subject to 3rd-party excavations that are adjacent and parallel to the mains, and meet the criteria set forth in 220 CMR 113.07: "Replacement of Cast-Iron Pipe

Adjacent to Parallel Excavations", paragraph (1) and paragraphs (2), (3) 1 or (4).

b. The replacement shall extend a safe distance beyond the point where parallel excavation terminates (see §113.07, paragraph (6)). This distance shall be determined by the appropriate Operations personnel. These mains shall then be submitted to Utility Engineering for review and authorization for replacement.

c. Until the pipe is replaced under **§12.24.5.1** and **§12.24.5.2**, Operations personnel shall coordinate the daily leak survey and monitoring of the pipe.

12.24.6 ANALYSIS OF CANDIDATES

12.24.6.1 After candidates have been identified based on the Elements 1 through 4 (see **§§12.24.4.1** through **12.24.4.4**), the candidates shall be manually prioritized. Frequency of breaks shall be used as the primary criteria. However, other factors may be considered. For example, marginal candidates, which provide a system benefit upon replacement, may be given a higher priority. Also, smaller diameter cast iron (particularly 3") may be given a higher priority when compared with a larger main with a similar leak history. Active leaks, highly corrosive soil, redundant mains, planned paving and street reconstruction may also contribute to higher prioritization of some candidates.

12.24.6.2 Candidates without sufficient leak history to warrant replacement will be given a higher priority if the observed conditions warrant such action. This would include cases of insufficient capacity to serve existing customers, abnormal loading conditions, insufficient depth of cover, or observed graphitization.

(REF.: 220 CMR 113

12.25 DRIP REPAIR/REPLACEMENT

12.25.1 PURPOSE

This section describes the proper procedure for repairing or replacing drips.

12.25.2 SCOPE

This section shall be used for the repair or replacement of pot drips, siphon drips, and lay-by or offset drips.

12.25.3 DRIP REPAIR

12.25.3.1 Leaking drip pots, stems, lids, and joints shall be repaired in accordance with accepted practices, such as by using one of following methods:

a. Drip stems that are leaking shall be repaired or replaced, as needed. Before repairs to a drip stem begin, it shall be determined whether the drip contains liquid. If it does, the liquid shall be removed using an approved method. If the repair is made to an elevated-pressure drip stem, then appropriate safety equipment shall be used.

b. Drip lids that are leaking may be permanently repaired by encapsulation. A special muff shall be utilized that conforms to the measurements of the drip. Elevated-pressure drip pot lids shall be restrained using approved devices before and after the encapsulation is done. Drip lid encapsulation repairs shall be limited to systems having an MAOP of 25 psig or less.

12.25.3.2 Lay-by drips that are leaking shall be cut out. A siphon drip or a fabricated pot drip shall be used if replacement is necessary. Liquid contained in a lay-by drip shall be removed using an approved method.

12.25.4 DRIP REPLACEMENT

Prior to any drip replacement, it shall be determined that the drip is required. Drips shall be replaced in accordance with the following:

12.25.4.1 Prior to removing the drip, Utility Engineering shall be contacted when bypass information is needed.

12.25.4.2 The drip shall be cut out using acceptable distribution system practices.

12.25.4.3 If the drip pot is to be replaced a fabricated pot may be used. The new drip pot, if metallic, shall be coated and protected in accordance with corrosion control specifications. The drip stem shall extend from the pot to six inches below street grade, and left accessible with a valve box.

12.25.4.4 If a siphon drip is to be installed in place of a pot drip, the stem shall be of at least nominal diameter pipe. The drip stem shall extend from the main to six inches below street grade, and left accessible with

a valve box. The new stem shall be coated and protected in accordance with corrosion control specifications.

12.25.4.5 Drip stems on elevated pressure mains shall have an approved valve six inches below street grade. The valve shall be left accessible with a valve box.

12.26 PLASTIC PIPE SQUEEZE-OFF MARKER

12.26.1 PURPOSE

This section describes the procedure for installing plastic pipe squeeze-off markers.

12.26.2 PROCEDURE

12.26.2.1 Whenever a plastic pipe is squeezed-off, a stainless steel band clamp or other appropriate squeeze-off marker shall be installed to cover the pipe at the squeeze-off point.

12.26.2.2 The installation of a squeeze-off marker should be noted on the Main Installation or Service Installation Report.

12.26.2.3 The plastic pipe should not be squeezed an additional time at the clamp location.

12.27 RESPONSIBILITY FOR MAINTENANCE OF FILTER INSTALLATIONS

12.27.1 GENERAL

This section describes who shall be responsible for the maintenance of filter installations on services or mains supplying individual customers or developments.

12.27.2 ABOVEGROUND INSTALLATIONS

Service Operations Personnel shall be responsible for maintaining all aboveground filter installations.

12.27.3 UNDERGROUND INSTALLATIONS

Distribution Operations personnel shall be responsible for maintenance of underground filter installations and all oil traps, excluding those located at district regulator stations.

12.27.4 NEW INSTALLATIONS

As required, Utility Engineering shall notify the appropriate personnel where and when new filters shall be installed.

12.28 PORTABLE GAS DETECTOR EQUIPMENT MAINTENANCE AND CALIBRATION REQUIREMENTS

12.28.1 PURPOSE

This section prescribes the minimum acceptable maintenance and calibration requirements for portable gas detector equipment.

12.28.2 SCOPE

12.28.2.1 The maintenance and calibration requirements described in this section shall apply to all portable CGI and FI units that are used, or are available for use, in gas operations.

12.28.2.2 Operations groups employing gas detection devices other than those listed in **§12.28.2.1** shall:

a. Adhere to written procedures for ensuring and maintaining the operating accuracy of such gas detection devices in accordance with the manufacturers recommendation.

b. Adhere to the documentation requirements specified in **§12.28.9**.

12.28.3 DEFINITIONS

12.28.3.1 *Cal Chek Station:* An apparatus employing controlled samples of 2.5% methane gas-in-air and 100% methane gas to check the calibration of the 5% and 100% combustible gas scales on CGI units (see **§12.28.10** Cal Chek Station Locations).

12.28.3.2 *Combustible Gas Indicator (CGI):* A combustible gas detection device employing a catalytic element and/or a thermal conductive element for detecting a combustible gas.

12.28.3.3 *Flame Ionization (FI) Unit* A combustible gas detection device employing a hydrogen flame ionization mechanism for detecting combustible gas.

12.28.4 GENERAL

12.28.4.1 If the maintenance and calibration requirements of this section do not meet the manufacturers recommendations, the manufacturers recommendations shall be followed.

12.28.4.2 Operations groups employing gas detection equipment may develop specific procedures (e.g., check lists) to assist in the calibration of the device.

12.28.5 CGI CALIBRATION AND MAINTENANCE REQUIREMENTS

12.28.5.1 Calibration and maintenance checks shall be performed at intervals not less than once each calendar year. CGIs out of service longer than one month shall be checked for calibration prior to putting them back into service. New CGIs shall be checked for calibration prior to being placed in service.

12.28.5.2 A means capable of recording the calibration information shall be completed following each calibration and maintenance check.

12.28.5.3 Calibration and maintenance checks shall be performed by the operator or other personnel trained to operate a CGI unit.

12.28.5.4 Calibration checks shall be performed utilizing a Cal Chek Station or an equivalent method.

12.28.5.5 CGI calibration checks shall verify the calibration of the 5% and 100% gas scales. CGI calibration readings shall be taken on the 5% scale using a sample of 2.5% methane gas in air and 100% scale using a sample of 100% methane gas in air. Cal Chek readings shall be within the limits stated below for acceptance. CGIs with readings outside these limits shall be removed from service and properly repaired and recalibrated.

CGI Scale	Cal Chek Test Methane	CGI Reading Acceptance Limits
5.0%	2.5%	2.5% to 2.8%
100%	100%	90% to 100%

12.28.5.6 In addition to the calibration check in **§12.28.5.5**. CGI units shall be checked for the following:

a. Voltage level check (i.e., batteries) and adjustment.

b. Zero reading check and adjustment (i.e., display needle properly zeroed).

c. System leakage check (i.e., no leakage shall be permissible).

d. Filter check (i.e., proper filter is operable).

e. An unobstructed sample flow.

12.28.5.7 CGI units shall not be utilized for gas operations unless they meet the acceptance criteria in **§12.28.5.6**.

12.28.5.8 CGI units which do not meet the maintenance and calibration requirements and can not be repaired, shall immediately be turned in to the employee's supervisor.

12.28.5.9 Calibration and maintenance services shall be performed by Operations employees, the manufacturer, or a qualified agency.

12.28.6 CGI DAILY USAGE CHECK

Prior to each use, CGIs shall be checked for sufficient voltage, zero reading, and system leakage.

12.28.6.1 CGIs with insufficient voltage shall require battery replacement. CGIs shall be rechecked for sufficient voltage after replacing batteries. CGIs with insufficient voltage after replacing batteries shall be removed from use and properly repaired.

12.28.6.2 CGIs that can not be adjusted for a zero reading on both scales shall be removed from use and properly repaired.

12.28.6.3 CGIs with system leakage shall be properly repaired prior to use in the field.

12.28.6.4 Filters shall be checked and replaced, as necessary, prior to use in the field.

12.28.7 FI CALIBRATION AND MAINTENANCE REQUIREMENTS

12.28.7.1 Periodic calibration and maintenance checks and services shall be performed by the manufacturer or a qualified agency.

12.28.7.2 Periodic calibration and maintenance checks shall be performed at intervals not less than once every six calendar months.

12.28.7.3 Each calibration and maintenance check as prescribed under **§12.28.7.2** shall be documented.**12.28.7.4** Maintenance and calibration checks shall consist of the following:

a. Voltage check

b. Sample Flow:2 pumps, 3 LPM

1 pump, 2.5 LPM

c. Response Time:

Funnel 1-2 sec. filter out

Funnel 2-3 sec. filter in

d. Fuel Source:
Regulator Pressures

5-10 PSI

e. Replace Internal Filter and Hose

f. Check Recharge Battery

g. Check Converter

h. Operations Examination

i. Check Calibration 100 PPM Gas

12.28.8 FI UNIT START-UP TEST

12.28.8.1 FI units shall be properly adjusted at each startup prior to use by the operator.

12.28.8.2 FI units shall be tested at each start-up using a sample of 2.5% methane gas in air at the funnels. An off-scale reading on the 10 PPM scale (D scale) shall be the minimum acceptable limit. Each start-up check shall be documented.

12.28.8.3 FI units with readings less than off-scale shall be removed from use and properly repaired by the manufacturer or a qualified agency.

12.28.9 DOCUMENTATION AND RECORD KEEPING

12.28.9.1 CGI Maintenance and calibration checks shall be documented and forwarded to Utility Engineering.

12.28.9.2 FI unit start up checks shall be documented and retained by Utility Engineering.

12.28.9.3 FI unit maintenance and calibration documentation shall be retained by Utility Engineering.

12.28.9.4 Records shall be retained for the life of the equipment.

12.28.10 CAL CHEK STATION LOCATIONS

A Cal Chek Station is available at the Operations Center Service Department

12.28 INSPECTION AND MAINTENANCE OF FIRE EXTINGUISHERS

12.29.1 PURPOSE

This section describes the procedure for inspecting, testing, and maintaining fire extinguishers.

12.29.2 SCOPE

This section shall apply to fire extinguishers that are located on Department vehicles used by Divisional personnel.

12.29.3 GENERAL

12.29.3.1 All fire extinguishers located, or required to be located, on Department vehicles used by Operations personnel shall be inspected, tested, and maintained in accordance with this section. Any such extinguisher temporarily out of service, shall be replaced by a spare extinguisher of the same capacity and fire rating.

12.29.3.2 Any time an extinguisher is used, it shall be reported to the employee's immediate supervisor, who shall ensure that it is refilled.

12.29.4 DEFINITIONS

12.29.4.1 *"Quick Check" Inspection:* An inspection, normally performed by Department personnel, that determines a fire extinguishers availability and operability. "Quick checks" are intended to give reasonable assurance that the extinguisher is adequately charged and is operable.

12.29.4.2 *"Thorough Check" Inspection:* An inspection that is more complete than a "quick check" inspection, usually performed during scheduled preventive maintenance by a contract specialist who also determines if a hydrostatic test of the cylinder is required.

12.29.5 INSPECTIONS OF FIRE EXTINGUISHERS BY DEPARTMENT PERSONNEL

12.29.5.1 A "quick check" inspection shall be made just after initial installation, and monthly thereafter.

12.29.5.2 The "quick check" inspection of fire extinguishers shall include the following:

a. After a monthly review of the vehicles used by each Division to determ0e their assigned location and which of those that require extinguishers, determine that the extinguisher exist~, is visible and is accessible.

b. Determine that the operating instructions are readily visible and legible.

c. Ensure that they are reasonably full by lifting or by weighing.

d. A visual check shall be performed to ensure that:

1. The seals and tamper indicators are not broken or missing.

2. The cylinder is not corroded.

3. The nozzle is not clogged.

4. There is no physical damage.

e. The pressure gauge or charge indicator shall be inspected to ensure that the extinguisher is in the acceptable operating range (e.g., needle in green area).

f. Prompt corrective action shall be taken on any deficiency, except that disposable (non-refillable) extinguishers shall be promptly discharged, discarded, and replaced.

g. Personnel designated to inspect the Division's fire extinguishers shall record all inspections. The record shall include the date of inspection, corrective action taken, if any, vehicle identification, and the name and initials of the inspector.

12.29.6 PREVENTIVE MAINTENANCE INSPECTIONS

A "thorough check" (i.e., preventive maintenance) inspection of the Department's fire extinguishers, by a contract specialist shall be performed annually in accordance with the manufacturer's service manual.

12.29.6.1 Each of the Division's fire extinguishers shall have a label or tag firmly attached showing the date of the "thorough check" inspection, the name of the inspector, and the tag or label initialed by the inspector. The label or tag should be weather resistant.

12.29.6.2 Disposable (non-refillable) extinguishers that are not satisfactory, shall be discharged, discarded, and promptly replaced.

12.29.6.3 Refillable extinguishers shall not be hydrostatically tested, but replaced in kind and capability for any of the following:

a. Any repairs needing welding, soldering, or patching compounds;

b. Corrosion pitting, including under the nameplate; or

c. Damage to the extinguisher by fire.

12.29.6.4 Hydrostatic testing shall only be performed by a contract specialist having the proper testing equipment and service manuals.

12.30 BARRICADES FOR WORK AREAS

12.30.1 GENERAL

12.30.1.1 The instructions and requirements of this section are minimum requirements for field guidance in planning uniform and adequate protection at work areas. This protection at work areas shall be observed in order to maintain the best possible protection for the public and Department employees.

12.30.1.2 This section was devised for average pedestrian and vehicular traffic, and working conditions. The person in direct charge of the work shall be responsible for the proper placement of barricades for unusual conditions where this section may not be applicable. Use more, rather than too little, warning equipment at the work area.

12.30.1.3 If a job operation will cause unusual hindrance to the flow of traffic, a Department representative shall contact the traffic precinct of the Police Department having jurisdiction over the area of the work location. There should be agreement as to the proper time and extent of traffic hindrance, so that work in the streets and public ways will avoid unnecessary interference with traffic. Under all circumstances, employees shall cooperate with the police officer at the work location. The set-up for protection at the work area shall be maintained for the duration of the job.

12.30.1.4 Protective equipment should include flashing barricades, warning cones, and yellow caution tape.

12.30.2 AT THE WORK AREA

12.30.2.1 The person in charge of the work area should check the job site to determine the type of protection necessary by considering the following:

a. Whether traffic conditions are those of high speed, moderate speed, or slow and congested.

b. Whether traffic is going to be congested or light.

c. Whether traffic may change during the job operations, as it may be necessary to make provisions for these changes in planning the set-up.

d. Whether visibility is good or poor and make allowances for weather and road conditions.

e. Whether a daytime operation may extend into the night hours.

12.30.2.2 On arriving at the job location, the Department vehicle shall be parked, whenever practicable, at the side of the road between oncoming traffic and the excavation. When a motor vehicle is involved at a work area, it shall be protected as part of the work area.

12.30.2.3 Each vehicle's emergency warning lights shall be put into operation immediately to warn the public that work is to be done in the area. These flashing warning lights shall remain in operation throughout the job during the day or night. The vehicle's flashing warning lights shall be the last warning equipment to be secured on leaving the job. It shall be the responsibility of the vehicle operator to ensure that the emergency warning lights are operating properly.

12.30.3 SETTING UP A WORK AREA

12.30.3.1 Adequate illumination shall be provided and the work area clearly defined so that pedestrian and vehicular traffic shall flow freely.

Only the minimum space required shall be occupied in the traffic lane.

12.30.3.2 Depending on the location of the excavation, flashing barricades and cones shall be placed as shown in Figures 1-4 of Appendix B, pages B-14 and B-15. For unusually heavy traffic conditions, the placement of barricades and cones shall be as shown in Figures 5 and 6 of Appendix B, page B-16.

12.30.3.3 Traffic cones shall be spread out and placed at an angle so that traffic is diverted away from the excavation. They shall be far enough from the work area to provide ample warning to drivers of approaching vehicles.

12.30.3.4 When the excavation is at the side of the road, as in Figure 1 *of* Appendix B, page B-14, a flashing barricade shall be placed behind the vehicle so that it projects toward the center of the street a distance of approximately two feet beyond the side of the vehicle. If additional barricades or cones are needed, the dispatcher shall be notified.

12.30.3.5 Equipment and material shall be placed within the barriers where they cannot interfere with pedestrian or vehicular traffic. Driveways and stairways to customers' premises shall not be obstructed unless permission is obtained from the occupant of the property.

12.30.3.6 In some cases, it is imperative to maintain pedestrian and vehicular crossings at the work area, and bridging is necessary. When establishing these crossings, suitable boundary definitions shall be set up to prevent persons and vehicles from falling into the excavation.

12.30.3.7 There may be places where a curve or hill in the roadway prevents approaching traffic from seeing a work area. If the distance between the work area and the curve or hill is within the distance shown in the following table, a warning sign shall be located at the point of curve, or at the highest point of the hill.

RECOMMENDED DISTANCE FROM WORK AREA TO END OF GUARDRAIL

	TRAFFIC SPEED		
TYPE OF WORK AREA	High (40 mph and over)	Moderate (22-40 mph)	Slow or Congested (0-22 mph)
Intersection	500 ft.	100 ft*	50 ft.
Side of Road	600 ft.	100 ft.	22-50 ft.
Middle of Road	700 ft.	220 ft.	50 ft.
Curve	800 ft.	300 ft.	100 ft.
Hill	800 ft.	300 ftv	100 ft.

12.30.3.8 When a Department crew leaves a job before work is completed, the barricades shall be moved as close to the excavation as possible.

12.30.4 PROTECTION AFTER DARK

Lights, such as flashing lights or floodlights, shall be used in conjunction with daytime safety equipment during the nighttime work area set-up. Nighttime shall be interpreted to include dusk and twilight periods, and when visibility is poor due to weather conditions.

12.30.5 PARKING

12.30.5.1 The emergency brake shall be set and wheel chocks used when any truck is parked.

12.30.5.2 Wheel chocks shall be used on all trailers when detached from motor vehicles, or when parked on a grade, even though still attached.

REVISION HISTORY

Date	Reason	Editor
7/28/03	Update Format of all Sections for future revisions	CRL
5/12/04	General Review	AAB
6/27/05	Change personnel titles, general review	AAB
5/23/05	Updated section on service valve accessibility. Added Section on ensuring valve accesibililty. Renumbered to maintain consitency	AAB